F·A·A·M facility for airborne atmospheric measurements

FLIGHT FOLDER

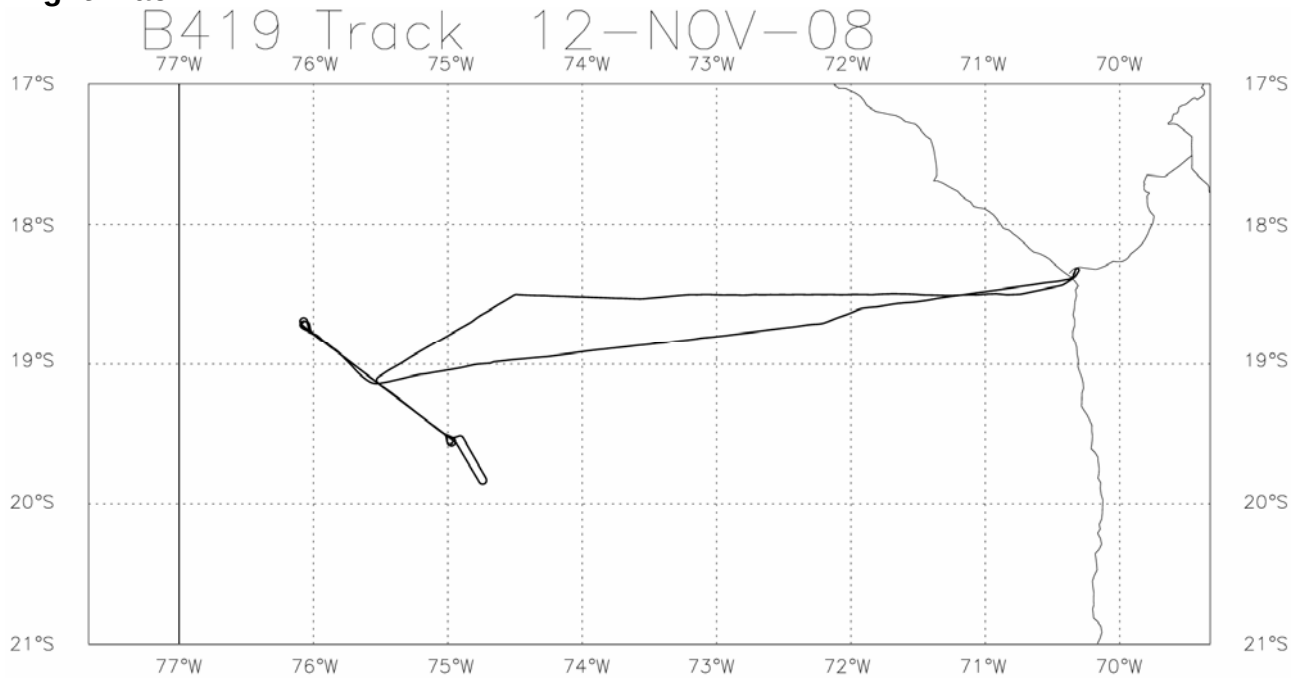
Flight No.	B419
Date:	12 November 2008
Take Off:	11:29:58
Landing:	16:51:38
Flight Time	5h 21m 40s

Campaign: VOCALS – Ron Brown Case Study

Operating Area: S.E. Pacific Ocean off the coast of northern Chile .

POB	Position	Name	Institute	Logs y/n
1	Captain	Alan Roberts	Directflight	
2	Co-pilot	Luc Lathouwers	Directflight	
3	CCM	Jackie Mullholland	Directflight	
4	Mission Scientist 1	Keith Bower	Manchester University	
5	Mission Scientist 2	Geraint Vaughan	Leeds University	
6	Flight Manager	Stephen Devereau	FAAM	
7	Core Chem	Kate Turnbull	FAAM	
8	Cloud Physics	Martyn Pickering	Met Office	
9	SWS / SHIMS	Debbie O'Sullivan	Met Office	
10	ARIES	Stuart Rogers	Met Office	
11	CAPS / 2DS	Jonny Crosier	Manchester University	
12	AMS / CCN	Paul Williams	Manchester University	
13	Wet Neph / PSAP / Filters	James Bowles	Met Office	
14	VACC	Mark Bart	Leeds University	
15	CVI	Paul Barrett	Met Office	
16	MARSS	Jeff Norwood-Brown	Met Office	
17	Mission Scientist 3	Grant Allen	Manchester University	
18	Mission Scientist 4	Phil Brown	Met Office	
19				

Flight Track:



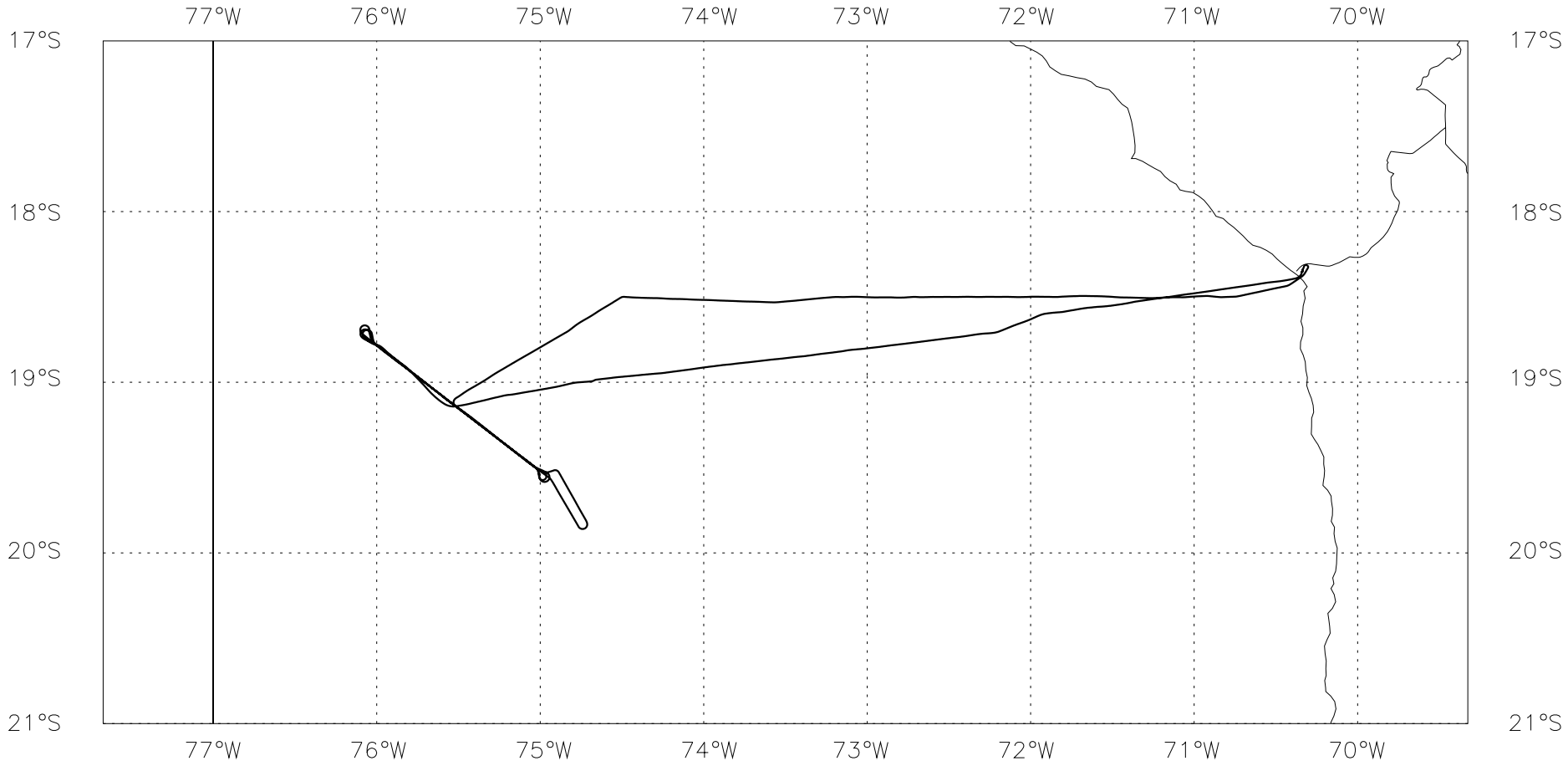
FLIGHT SUMMARY

Flight No b419
Date: 2/11/2008
Project: VOCALS
Location: Arica, Chile

Start Time	End Time	Event	Height (s)	Hdg	Comments
112006		Start-Up	0.13 kft	023	engines
112425		start taxy	0.13 kft	022	
112611		!	0.12 kft	289	ASPs opened
112958		T/O	0.49 kft	209	
112958	113646	Profile 1	0.00 - 6.0 kft	223	
113616		!	6.0 kft	262	Nevzorov / JW zero
113709	114005	Run 1	6.0 kft	262	
114011	114627	Profile 2	6.0 - 0.50 kft	262	QNH 1015 hPa
114627	115128	Run 2	0.50 - 0.44 kft	260	QNH 1015 hPa
114830		!	0.44 kft	266	Johnson Williams zero
115133	115456	Profile 3	0.43 - 3.3 kft	259	
115457	120005	Run 3	3.2 - 3.3 kft	245	
120023	120130	Profile 4	3.5 - 4.6 kft	262	
120138	120637	Run 4	4.6 - 4.5 kft	264	
120647	121139	Profile 5	4.5 - 0.50 kft	264	
121147	122229	Run 5	0.50 - 0.58 kft	258	
121347		!	0.45 kft	262	Heimann cal
122304	122539	Profile 6	1.1 - 3.5 kft	263	
122547	123604	Run 6	3.5 kft	260	
123609	123751	Profile 7	3.5 - 5.1 kft	264	
123751	124433	Profile 8	5.1 - -.05 kft	257	
124448	125718	Run 7	0.1 kft	255	100
125230		!	0.1 kft	315	Heimann cal
125725	130052	Profile 9	0.1 - 3.5 kft	308	
130222	132201	Run 8	3.5 kft	127	
132202	132354	Profile 10	3.5 - 4.9 kft	127	
132354	132849	Run 9	4.9 - 4.8 kft	145	
132743		!	4.8 kft	150	Nevzorov/JW zero
132958		!	4.8 kft	007	Heimann cal
133027	133526	Run 10	4.8 kft	331	
133800	135655	Run 11	3.2 - 3.1 kft	308	
135733	135843	Profile 11	3.1 - 2.2 kft	348	
140051		!	2.2 kft	114	Nevzorov/JW zero
140112	142140	Run 12	2.2 kft	105	
140908		!	2.2 kft	128	Heimann cal
142140	142633	Profile 12	2.2 - -.05 kft	129	

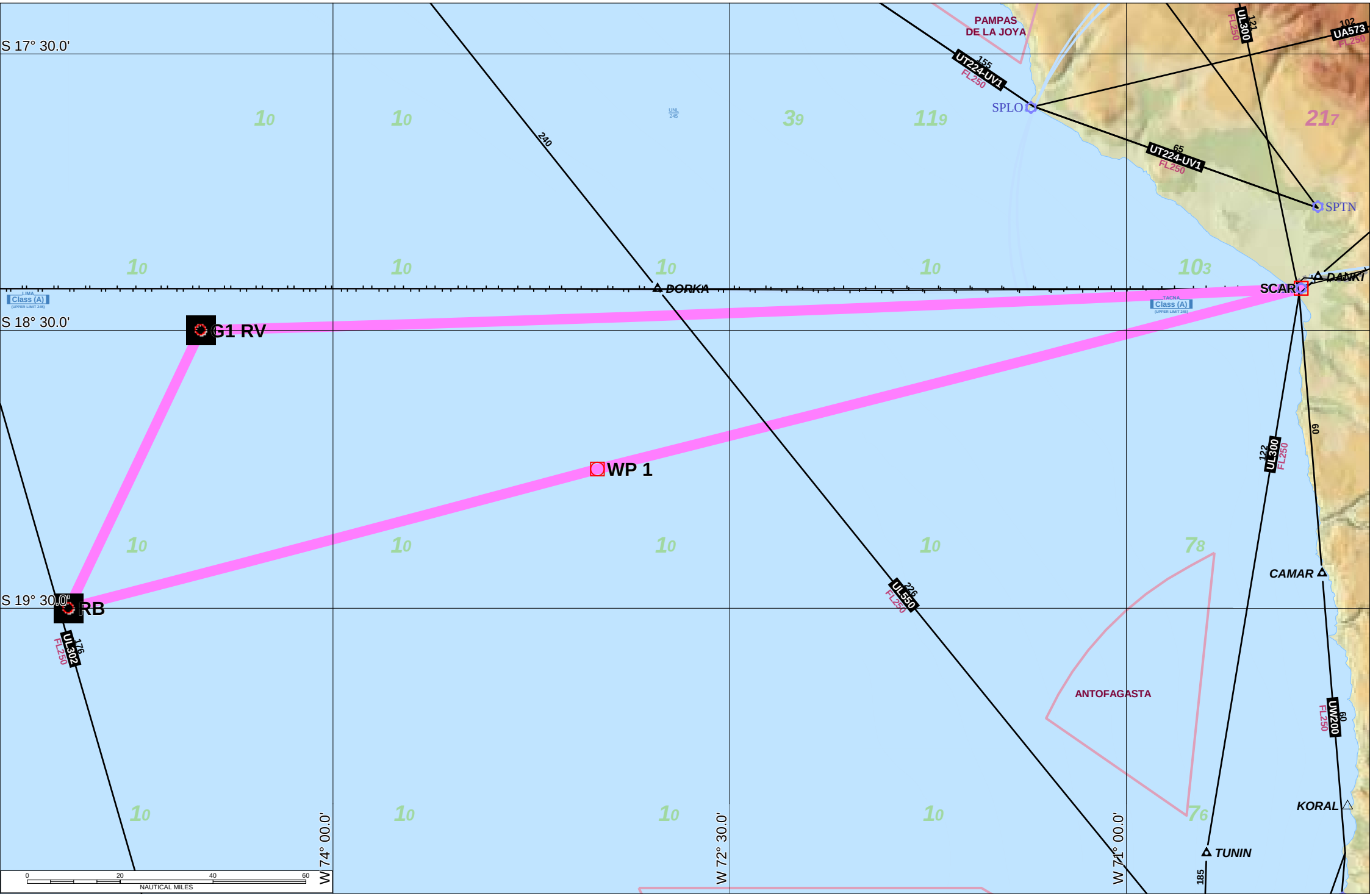
142643	144457	Run 13	0.1 kft	308	
143754		!	0.1 kft	307	Heimann cal
144521	145552	Profile 13	0.40 - 9.9 kft	305	
145022		!	5.2 kft	129	JW zero
145227		!	6.9 kft	128	JW zero
145552	150038	Profile 14	9.9 - 6.0 kft	126	
150039	150824	Run 14	5.9 - 6.0 kft	129	
150945	151341	Profile 15	5.9 - 3.9 kft	136	skimming cloud tops
151437	152155	Run 15	3.8 kft	308	
152155	152759	Profile 16	3.8 - 0.05 kft	309	
152514		!	1.3 kft	061	JW zero
152759	153225	Profile 17	0.05 - 4.5 kft	062	
153352		!	4.5 kft	060	Nevzorov/JW zero
154048	154144	Profile 18	4.1 - 3.4 kft	072	coordinated with G1
154144	155140	Run 16	3.4 - 3.3 kft	094	
154845		!	3.4 kft	091	JW zero
155140	155508	Profile 19	3.3 - 0.99 kft	091	
155516	160506	Run 17	0.95 - 0.99 kft	094	
160516	160910	Profile 20	1.0 - 4.5 kft	094	
160856		!	4.3 kft	086	JW zero
160910	161909	Run 18	4.5 kft	084	
161051		!	4.5 kft	087	Heimann cal
161915	162523	Profile 21	4.4 - 0.05 kft	088	
162302		!	1.3 kft	091	Jw zero
162524	163101	Profile 22	0.05 - 5.0 kft	089	
163050		!	4.9 kft	089	JW zero
163101	163726	Profile 23	5.0 - 0.50 kft	089	
163313		!	3.4 kft	090	JW zero
163455		!	1.9 kft	089	JW zero
163727	164225	Profile 24	0.50 - 5.0 kft	085	
164332		!	5.1 kft	078	JW zero
165138		Land	0.18 kft	109	
165336		!	0.18 kft	018	ASPs closed

B419 Track 12-NOV-08



SCAR -> SCDA - Overview
NavData Cycle 2008-11 Expires: Thursday, 20 November 2008.
Scale: 1:1838389 (1 inch = 25.21 naut mi). Printed on 11 Nov 2008

7 6 9 9 6 ; 6 8
FliteStar 9.4.2.0



FAAM Sortie, Flight B419
Wed 12th November 2008
VOCALS Flight B419 – Ron Brown Case study

T/O **0830 local (1130 UTC)**
Land **1350 local (1650 UTC)**

Mission Scientists: Keith Bower, Grant Allen, Phil Brown, Geraint Vaughan

Operating Area: South East Pacific Ocean, off the west coast of northern Chile, with ops area centred on 75^{o} W, 19^{o} 30' S

Waypoints:
ROMEO: 75^{o}32'21'' W, 19^{o}5'30'' W
R1: North end-point of run 35 NM from ROMEO along Ron Brown radar radial
R2: South end-point of run 35 NM from ROMEO along Ron Brown radar radial
GOLF: 74^{o} 30'W, 18^{o} 30' S

Radial to operate over point ROMEO: 125 and 305 degrees

Ron Brown Contact: Marine VHF RHB guards channel 13 and 16
Or on handheld radio on 123.45 MHz

Sortie Objectives: To overfly the Ronald H Brown (RHB) cruise ship whilst on station at point ROMEO and perform a case study of the area; and intercompare radiometric and cloud instruments with measurements made by the Dornier and RHB. An in-and-below cloud trailing intercomparison will also be made with the Dornier on the outbound transit to ROMEO and a further intercomparison with the G-1 will be made in-and-below cloud on the return transit to Arica. A ground intercomparison with the C-130 will be carried out for one hour after landing.

Weather: High pressure system off shore capping a marine boundary layer with widespread Sc cloud. Near shore light marine boundary layer winds from S.

Key Instrument Details:
SWS/ARIES – as per instructions.
CVI - During high level operate in aerosol mode with CVI hygrometer operating.
CVI – during in cloud runs operate in counterflow mode
Wet Neph – operated during all of 500ft runs
AMS – operate from Rosemount during aerosol and high level runs and profiles; operate on CVI during in cloud runs

Information:
Latest satellite image will be inserted prior to take-off

B419 12th Nov 2008

Flight patterns:

1. Take off and profile ascent 1000 ft/min immediately to 6,000 ft amsl and begin short minute run to check instrumentation, setting radial to ROMEO [15 min; T=0h 15 m]

2. Profile descent to 500 ft amsl for a 10-minute SLR run below cloud. (*Advise Dornier of the lat/lon of the start of the SLR)* [13 min; T=0h 28 m]

3. Profile ascent to in-cloud at flight level advised by mission scientist for a 10-minute SLR run. *(Advise Dornier of the lat/lon of the start of the SLR)*
[11 min, T =0h 39 min]

3. Continue to point ROMEO and make contact with Ron Brown as soon as possible. *(Relay position of RHB and radar radial to the Dornier)* [36 min, T=1h 15 min]

4. At ROMEO, turn to R1 to align with RHB radar northward radial and begin 35 NM SLR run at 100 ft amsl *(Advise Dornier of the intended end point of run and coordinate the Dornier to meet us at a point on the run.)* [10m, T=1h 25 min]

5. At R1, turn toward R2 and begin a 20-minute SLR run in-cloud (100 ft below cloud top) [22m, T=1h 47 min]

6. Run 3x20-minute SLR legs between R2 and R1 at altitudes advised by the mission scientist for as long as the Dornier remains coordinated with G-LUXE
[1h 06m, T=2h53m]

7. After Dornier breaks off, run a 20-minute saw-tooth profile between 50 ft and 1000 ft above cloud top, between R2 and R1 [22m, T=3h 13m]

8. Continue SLR runs between R1 and R2 at altitudes advised by the mission scientist for as long as possible before turning toward GOLF [32m, T=3h45]

9. Turn to intercept GOLF to arrive at 1240 Local [T=4h 10m]

10. At arrival at GOLF turn to fly 3x10 minute SLR runs above, in and below cloud along the 18 deg 30'S latitude line. *(Relay longitude of start and end times of each run to the G-1)* [30m, T= 4h 15m].

11. Recovery and land at Arica [T=5h 20m]

Mission Scientist's Log [VOCALS – RON BROWN #2]

Flight No B419 **Date** 12/11/08 **Name** K. N. BOWER **Page** 1 **of** 11

Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
8:20:16 KNB, 8:20:29, 8:21:29, 8:22:01 – 8:22:39					Starting 4–1
8.22.55 "					power change over (taxi directly across R/W)
8.24.45 "					Taxi (P settles 1014)
8.29.48 "					Rolling 09/03kts, [illegible] Dornier Taxiing
8.30.19 "					T/O/P1 Clear skies above – patchy/cloudy on horizon
					– quite a bit more SO_2 & NO_x than below
8.34.04 "					Going over cloud edge now.....
					.... setting up MSci Laptop. (because at DO 228 UK)
11.37.09	R1				AMS Hardfields – setting screwed – no trim now – will go down.
11.40.01	R1end/P2	5.9 kft	262	18°24'/70°54'	(to 500ft) 812mb 17.74°/-10.17°C 1m/s/159°
11.42.48	P2	3.4 kft	263	18°30'/71°6'	CT ~ 3500ft 893mb 9.99°/2.48°C 2m/s/204°
11.43.34	P2	2.7 kft	262		cb ~ 2700ft, 917mb (1014 QNH) 10.86/11.72°
					(setting new QNH = 1015) 1m/s/220°
11:46:27	P2e/R2start	0.5 kft	260	18°30'/71°26'	P1 [S 18° 32.41' – W 071° 25.66'] → DO 228
					994mb, 17.69°/12.56°C 2m/s/220°
8:51:00 = 11 50 34 (KNB = Ronau)					DO 228 will arrive park 1 12:00
	Comms	(to KNB from DO 228)			R Brown (19° 4.9 min S, 75° 32.3 min W)
					Heading 157° and 5.3 kts currently.
11.51.27	R2end/P3s	0.4 kft			from 500ft 997mb, 17.71/12.2°C 1m/s/212°
11.54.55	P3end/R3start	3.2 kft	265	18°36'/71°54'	P2 (S 18° 37.43' W 071 59.04) (originally 18°33 71 59.0) → DO 228
					Start at 3300ft in cloud, 9.01/10.44°C 2m/s/150°, 990mb
***	Comms	DO 228			Electrical problem – intermittent power spikes ***
					– power inverter has gone/playing up – lost winds
12:00:01	R3end/R4start	3.2 kft	262	18°42/72°18'	↑3300ft to 1000ft above CT. 8.47/9.72° 2m/s/148° (RTB 990mb)
	P4				CT 3600 ft.

[arriving RB ~ 12:11]

next C run @ 3200ft ....

Mission Scientist's Log

Flight No B. 419 **Date** 12/11/08 **Name** K N Bower **Page** 2 **of** 11

Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
4600ft 12:01:29	R4E/R4	4.5kft	263	18°42'/72°24'	p=858mb 19.45°/-13.11°C 2m/s/282° Above CT run
12:06:33	R4E/PS$_S$	4.5kft	264	18°42'/72°42'	853mb 19.11/-6.95°C 2m/s/278° (WESTBELL!)
12:07:20	PS	3.8kft	265	" /72°48'	CT=3600ft 850mb 14.25/15.98 1m/s/314°
12:08:03	PS	3.0kft	262	" /72°40'	CB=3100ft 908mb 9.14/18.45 2m/s/141°
					(QNH setting 1016mb)
12:11:37	PS$_E$/R5	0.5kft	261	18°48'/73°6'	500ft 995mb 16.66/11.33°C 4m/s/165°
12:13.00	Comms	0.4kft	260		Clouds at RB CT=1100m (ie ~3600ft)
					CB=750m (ie ~2460ft)
					little drizzle not reaching surface
					Cloud deck – uniform all way out to RB.
12:32:16	R5$_E$/P6	0.4kft	260	18°48'/73°48'	996mb 16.07/11.05°C 7m/s/140 500ft ↑ 3500ft
12:24.56	P6	2.8kft	260	18°54'/73°54'	CB=2900ft. 913mb 9.21/9.91°C 5m/s/149°
12:25:40	P6$_E$/R6$_S$	3.4kft	260	18°54/74°	3500ft 893mb 7.74/10.09°C 5m/s/151°
	R6				Core Cloud CDP 270 cm^{-3} 12μm ϕ
					FSSP 420-450 12-13μm
					drizzle 15/litre 200μm
					2DS CAS 500-600 13μm
					drizzle – not high
12:29:45	RON BROWN	COMMS			POS^n 19° 27.318'S 075° 19.812W
					19° 27.363'S 075° 19.790W
but previously					19° 49 min S 75° 32.3 min W ?
					latter coords near the original points quoted
					last night – go there first
					– currently steaming 158° @ 5kts – shear –
					15mins – scanning 125, 305° confirmed.

Mission Scientist's Log

Flight No B. 419 **Date** 12/11/08 **Name** K.N. Bower **Page** 3 **of** 11

Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
12 36 : 04	R6/R7	↑ 3.4kft	264	18°54'/74°42	3500ft 893mb 7.7°/10.09° 5m/s/161°
12.36.39	P7	3.9kft	250	19°/74°42	CT = 4100ft 875mb 7.95/9.3° 6m/s/162°
12.37.45	P7/P8	5.0kft	257	19°/74°48'	5100ft 862mb 19.0°/-24.58 0m/s
12.39.49	P8	3.9kft	259	19°/74°54'	CT=4000ft 876mb 18.32/-30.36 3m/s/155°
					seeing bit dust shd NOx dropped
					clearly measuring clean values - sish CO
					O3
12---.					—
					Cpt confirms pos'n 19° 30'
					74 30' at 12.40
					at 5000ft. ✓
					X dust — .....
					CB 2500
					- first pass to N — subsequent pick
					- sic are not sharing wind
12.44.28	PBend	50'/0kft	254	19°/75°18'	SOft 1013mb 16.95°/12.21°C 3m/s/160°
12.44.38	R7	100ft/0kft	253	19°6'/75°18'	100ft 1013mb 16.92°/12.14°C 4m/s/165
12.47.47	RBrown	100ft/0nft	260	19°6'/75°30'	Ron Brown to CMS — Visual Contact. Pics.
					R1 S 18°46.87' W 076°00.13 (Cpt LL.)
					R2 S 19°29.97' W 75°01.73 (Cpt LL.)
					RB S 19°08.46' W 75°30.99' (Cpt LL.)
12.50.15	R7				4 mins for turnaround at R1
					PCASP CVI not much above 1µm !!!
12.57.17	R7/P9	0kft	308	18°42'/75°54	100ft 1011mb 17.03/11.83 3m/s/172°
13.00.12	P9	2.7kft	183	18°36'/76°6'	CB = 998mb 9.02/10.07° 7m/s/132°

RB

R1 RB

R2

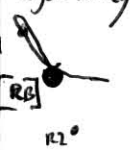
4 mins for turn

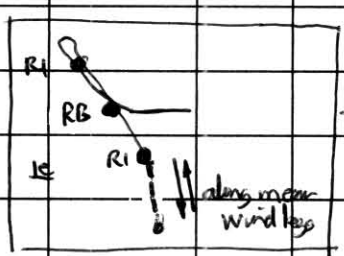
one last to do

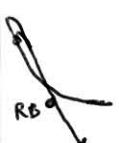
Mission Scientist's Log

Flight No B. 419 **Date** 12/11/08 **Name** K. N. BOWER **Page** 4 **of** 11

Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
13.00.52	P9 end	3.4kft	131	18°42'/76°	3500 ft 894mb, 7.87/10.47°C 7m/s/129°
13.02.21	RB start	3.4kft	127	18°42'/76°	3500 at R1 now. 893mb 7.75/10.45° 7m/s/113°
13.05.50	RB	3.4kft			New CT now.
					Cirr Cloud :- CDP = 200 cm^{-3} ⌀ 20 μm
					FSSP = 250 cm^{-3} ~~⌀ 20~~ 19 μm
					2DC = 20/l 200 μm
					CAS = 450 cm^{-3} & 15 - 20 μm
					LWC = 0.7 - pretty high.
13:08					(about 2hrs left now...)
					MSi4 - strange wind ..... ?
					tower... 710 0700 20s → 804 -
					dropsin sondes on high level return - C130✓
13:12:07	RB below	3.4kft	127	19°06 75°30	710 1⌀ over head - low level all way.
					M2-M4 - winds are light ....
					M2 - option - find point above cloud - perform number reciprocal legs ~5 min duration - along mean wind direction - check wind calibrations
					M3 - CO vs latitude - reasonable gradient 60-65
					CO reasonably stable ??
				NB	On way out - passed through plume.... NB
13.21.58	RB end / P10 start	3.4kft	128	19°24'/75°	3500ft 893mb 7.54/10.29° 6m/s/108°
13.22.30	P10	3.8kft	128	19°30'/76°	CT=3900ft 881mb 8.87/9.78° 4m/s/101°
13.23.40	P10 end / R9	4.7kft	137	19°30/74°54'	4900ft 849mb 15.35/-27.67 1m/s/98°
					on profile we passed through o/c CO/O3
					at bottom of layer - CO 70ppb







13.08 ~2hrs left .....
13.09 leave for G1 R/V ... 2hrs - M3 - YIP
1hrs 30 -

[90 mins — 20 cloud 70 mins left
20 BC 50
25 BC 25 → leaves about an hour for something else]

Mission Scientist's Log

Flight No B...419 **Date** 12/11/08 **Name** K N BOWER **Page** 5 **of** 11

	Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
						M3 - ..... [4900ft, 848mb 19.29°/25.28° 3m/s/121°
4900ft	13.28.48	R9 end	4.8kft	150°	19°48'/74°42'	turning for reciprocal on heading 330 nav
						G1 airborne as per schedule ..... timing OK ✓
4900ft	13.30.25	R10 start	4.8kft	332°	19°48'/74°42'	847mb 19.3°/-26.13°C 2m/s/270°
	13.33				(MSc13 from MO)	D_0^{228} will know within hour - status go/no go
	13.35.25	R10 end	4.8kft		19°30'/74°48'	4900ft → 3200ft (no profile descent - time)
						848mb 18.74°/-28.08° 2/270°
—	13.36.24	descent	3.7kft	252	19°30'/74°54'	CT 3900ft 882mb 8.06/-41.38°C 3m/s/189°
3200ft	13.37.59	R11 start	3.1kft	307	19°30'/75°W	320 aft 8.15/10.81°C 903mb 2m/s/134°
[RB]	13.47.24	above RB	3.1kft.	307	19°6'/75°30'	903mb 8.15/10.52°C 3m/s/170°
						Core cloud: CDP 160-170 cm⁻³ ⌀ 16μm
						FSSP 280 cm⁻³ ⌀ 16μm
						drizzle 30/litre (up to 250μm) (fluctuating)
						but more stable than other runs 20-40/litre
						CASE < 400 cm⁻³ ⌀ 14-15μm
						LWC = 0.3 g/m³
						~~Core Cloud~~ 2DS - not much drizzle ....?
						M3: Nev 0.3 g/m³ } similar to CAS then.
						JW 0.4 g/m³ }
						LWC ve quite homogeneous above 3
						- good to cf LWC retrievals .....
					MG - RBrown	"CB from smooth footing"
						Weak large scale ....
					MG	NOAA W band ....
	13.56.53	R11 end	3.1kft	309	18°42'/75°54'	3200ft. 903mb in cloud. 8.51°/10.6° 2m/s/139
	13:57.26	P11 start	3.1kft	344	15°42'/76°0'	Descend to 300ft below cloudbase.
	~~13.08 2kft left~~					

Mission Scientist's Log

Flight No B. 419 **Date** 12/11/08 **Name** K N. BOWER. **Page** 6 **of** 11

Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
13 58 : 10	P11 ↓	25kft	346	18°42'/76°0'	CB = 2500 923mb 9.37°/11.01° 3m/s/138°
13.58 : 39	P11 end	2.1kft	274	18°36'/76°0'	2200 ft, 937mb 10.80°/10.55° 4m/s/152
					M4 – Wind peaks with sonic upward velocity
14:01.12	R12 start	2.1kft	105	18°42'/76°0'	2200ft 937mb 11.01°/10.64° 5m/s/100°
					Core Cloud – 2 drops / litre
					2DS –
					AMS nothing significant...
					Core Cloud – 70 pcasp
					CVI pcasp = 150-200 cm^{-3} CPC ~600
					FAAM CPC 400 cm^{-3} ↕ 400
					CDP 85/400 @ 0.1%
					vAcc – 4mill 2mill ch 1, 2 – huh!
					SMPS – monomodal – peak ~ 120 nm
					not much < 20-30 nm
				M3 report	– Only thing changed < 0.2°C SST
14.11.45	RB	2.1kft	129	19°6'/75°30'	all else constant – small ascent –
14:21:39	R12e/P12	2.1kft	129	19°24'/75°0'	2200ft → 500ft now 937mb 10.54°/10.55° 4m/s/119°
14.26.31	P12 end	0.1kft.	308	19°24'/75°0'	500ft / 1013mb 16.9°/12.24° 3m/s/169°
14.26 (43)	R13 ↓				100ft ~ 16.67°/11.91° 2m/s/160°
				M4 reports	– Not well mixed – like M3 reported !!
					980 mb – bout here relatively thin cloud in
					small supersaturation at 980mb
					suspect lower layer BL.
					Do 228 – run on GPU for an hour – ARSF
					team – Dol flg for an hour.

Mission Scientist's Log

Flight No B...419 **Date** 12/11/08 **Name** K.N. BOWER **Page** 7 **of** 11

Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
14.35.11	RB	100ft/0kft	304	19°6'/75°30'	RB fly past – spike on fly past @ 100ft
					spikes on CPC's (16.75°/11.55° 1012mb 4/190)
					might be – dilt slightly SO_4 ↑ O_3 ↓
					SO_4 2 µg/m³; O_3 0.6 (AMS)
					SMPS – mostly mono modal – slight shift to larger sizes
					150 nm maybe slightly smaller
					Core Cloud PCASP ~ 90 cm⁻³
					CN1 (PCASP) 12 cm⁻³
					CPC = 400 cm⁻³
					AMS CCN – ~90–80/400
14.43.00					Sea Salt on Windscreen
14.44.56	RB end/PB start	100ft/0kft	305	18°42'/75°54	100ft/1012mb 16.91/11.95° 5m/s/162°
14.47.44	PB	2.7kft	174	18°42'/76°0	CB on PB 9.57/10.32° 5m/s/122
14.48.50	PB	3.7kft	115	18°42'/76°00	CT 3900ft/882mb 7.12°/9.76° 5m/s/89°
					T/C profile small inversion at 950 mb (1645)
					supercadiabatic on way down – small inversion
14.49.37	PB	4.4kft	125	18°42'/76°00	on way up ↑ ↑ out R1 now 860mb 19.21/–19.78°
~~14°42 0~~					~~above RB now~~) ???
		4.8kft			entering pollution at 4800 ft
				(M4	D. 228 short i/c runs with 146 tomorrow am now)
		6.0kft			through a little O_3 layer 6.0 kft
					all correlates with CO ↑ as we go
14:54.50	PB				G1 :- .....
					layer 4500 → 10000 out of pollution
14:55.52	PB end/PK start	9.9kft	126	19.0°/75.7°	10000ft
14.56.05	PK +	9.9kft	125	19°0'/75.36	698mb 14.51/–25.79° 1Km/s/105°

Mission Scientist's Log

Flight No B. 419 **Date** 12/11/08 **Name** K N Bower **Page** 8 **of** 11

Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
15: 00 37	P14out/R14	5.9kft	129	19°12'/75°24'	6000ft. /813mb 18.51°/31.62° 3m/s/129°
15 08 24	R14end	5.9kft	126	19°24/75°0'	6000ft /813mb 19.86/-30.37 5m/s/92°
					Will do a run in CT - turbulence / entrainment
~~6000ft~~ ~~15.05.24~~	~~R14end~~	~~5.9kft~~		Slide 31	check - Pickle down to CT....
15.09.45	P14 st ↓	5.9kft	136	19°30/74°54'	813mb/6000ft 20.01°/-30.22° 5m/s/103°
					Remarked - entrained most readily at CO
15.12.01	R14/R15	3.9kft	293	19°30/74°54'	4000ft CT. 877mb 16.64/-17.08° 3/242°
~~50ft~~ ↓ 15.14.27	R15	3.8kft	308	19°24/75°6'	dropped to get into CT properly 886mb 9.57°/-5.12°C
~~50ft~~ 15.16.11	R15	3.8kft	307	19°18/75°12'	dropped to get into CT again 880mb 10.57°/-0.13°C
15.21.52	R15end/P16	3.8kft	309	19°06/75°30'	W = -1.52 m/s .. 880mb 6.92°/9.81° 2m/s/113°
15.23.39	P16	2.4kft	56	19°0/75°24'	CB 2500ft diffuse 927mb 9.52/10.71 2m/s/63°
15 27.58	P16/P17	0kft	62	18°54'/75°12'	50ft heading out to G1 r/v 1013mb 17.26/12.82°
					Load satellite picture - which shows
					Point Golf - right on edge of coastal decent
					part - so possibly will not have enough cloud
					for the intercomparison with G1.
15.31.46	P17	4.0kft	61	18°48'/75°0'	CT 3900ft 16.95°/6.88° 874mb 1m/s/220°
15:32.13	P17end	4.4kft	60	18°42'/74°54	AMS - CCN → 0.2% new, 4500ft/860mb
15.36.03	Transit	4.4kft	56	18°36/74°42'	860mbar 18.59°/-23.94°C 1m/s/32°
15.40.41	Descent	4.2kft	58	18°30/74°30'	Slight ↑ O_3 35 ppb - anticorrelated with ...
15 41.13	Descent	3.7kft	99	18°30/74°24'	CT 3500ft on descent to ice level. 883mb.
15.41.38	Descent	3.4kft	99	18°30/74°24'	893mb 8.39°/-0.24°C 2m/s/84°
					G1 varying between 3400–3700' to stay in cloud
					And modys - here :-
					CDP 0–300 cm^{-3}
					FSSP 0–500 cm^{-3}
					drizzle occasional 75 μm in size

~~(-18.5 -74 W)~~

Mission Scientist's Log

Flight No B.449 **Date** 12/11/08 **Name** KN.BOWER **Page** 9 **of** 11

Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
15 41 13	Desc	3.7	94	18°30'/74°24'	883 mb 10.26°/-26.23° 3 m/s/91°
15.41 36	Desc	3.4	94	18°30'/74°25'	893 mb 8.39°/-0.24° 2 m/s/84°
15.43 18	Desc	3.5	94	18°30'/74°18	890 mb 7.51°/8.69° 3 m/s/69°
15.44 05	Desc	3.4kft	92	18°30'/74°12'	Cloud just burning off – dropped another 50ft
15.51 39	Rube/PPS	3.3kft	91	18°30'/73°48'	to 1000ft for 1st run. 869 mb 9.06°/9.01°
					(1014 not bad as QNH)
15.55.04	Prog/RU7	1kft	94	18°30'/73°30'	1000ft run/976mb 15.05°/11.93° 2m/s/153°
					AMS 5μg SO_4, 0.7μg Org
					CPC ~ 700–650 cm^{-3}
					CCN 250–275 on 0.2%
					PCASP 150 cm^{-3}
					M4 missin
					CN1 PCASP 240 cm^{-3}
					CPC 650 cm^{-3}
					VACC PCASP ....
				MS	Ocean Eddy d 15 nms 16[illegible]mile
16 05 05	RU7/P20	1000/0.9kft	93	18°30'/73°0	977mb 15.67/11.16°C 1m/s/99°
16 09. 10	P20c/RU8	4.4kft	85	18°30'/72°42'	4500ft/861mb 18.53°/3.92° (CB was ~3.0kft)
16.07.46	P20	3.2kft	90	18°30'/72°48'	CT was at 3300/898mb 12.65°/8.42° but
					AMS CPC counts slightly higher at this level than at 1000ft
					CCN = 200 (@.2%) CPC 900 cm^{-3}
					(below cloud 250 particles / 650 cm^{-3})
	P20cnt	4.4kft.			SMPS – definite – poss bimodal.
					55nm diameter smaller.
16.13	RU8				PCASP – 50 cm 2ds 3 cm^{-3} / smallish

600nm

(CL Leg 1 – S 16 36.14 W 074 26.61
BC 1000ft Leg 2 – S 16 31.84 73 30.93)

Mission Scientist's Log

Flight No B. 419 **Date** 12/11/08 **Name** KN Bower **Page** 10 **of** 11

Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
					SO4 readings have decreased — less Aec
					mode — more 100nm and less particles
					— likes in mth ↓ in CCN #
16.19.09	R16/R21	4.4 kt	88	18°24'/72°6'	4500ft / 860mb 19.8°/1.88°C 6m/s/355°
					(Strata Sawtooth profile down to 50ft)
					Core Chan — variation in O_3 12–22 ppb
					(CO_2 too)
16.25.21	P21/022	0kft	89°	18°24'/71°42'	50ft/1010mb 18.92°/13.06°C 1m/s/218°
					AMS 2000ft — 50 no change on Ae/Ruh
					high SO4 — lower total CPC
					higher CN
					→ reduction ratio
					CPC counts
16.30.50	P22/023	4.8kft	89	18°30'/71°24'	846mb 20.91°/-17.62° 4m/s/2°
					sub 100nm mode — slightly higher CPC
					↓ CN
					G1 — doing same as was now (sawtoothing)
					just above CT — distinct layer — strong W
					component — 50 inter Hinde — strong 10kt N
					NW → N.
16.32.12.	P23	5.3kft	90°	18°30'/71°12'	3400' (CT) 4.77°/-6.04°C 2m/s/311°
16.33.49	P23	2.8kft	89°	18°30'/71°12'	CB — but very very murky — hazy
					(1015 good QNH)
16.36.48	P23				Fishing Boat below

Mission Scientist's Log

Flight No B. 419 **Date** 12/11/08 **Name** K.N. Bower **Page** 11 **of** 11

Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
16.37.21	P23/24	0.5kft	84	18°24'/71°0'	500ft / 994mb 16.73°/13.79° 2mls/26°
16.38.38	P24				(QNH Arecia set at 1012)
		3160			Some whirly CT's around here.
16.42.23	P24 end	4.9kft	77	18°24'/70°42	5000ft – end of science.....
					L everything is very hazy here.
16.51.57	Landed				

Instrumentation B419.

Mercs — US

PCasp — same as usual.
1 hard disc

CVI — Ric

Nephs — ✓

SWS — ✓

AGREs — OK

VACC — PCASP scanned — no useful data.

Corechem — no problems.

2DS — CAPS ✓✓

AMS ✓

SMPS ✓

Bnch operating OK

Ron Braun — decimal position — ?? wrong
saw him on radar ahead as headed to original posn 1st

Jan 7/0 Low level out - 80 W
multiple heights — high level return
Do ascents as before — profile up — to low level
Fly out again with C130 7/0

M.S.2

Mission Scientist's Log

Flight No B.149 **Date** 12/11/08 **Name** Phil Brown **Page** 1 **of** 3

Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
1130					t/o ARICA, v. light sfc. wind.
113542		5600↑			over cloud now.
—					RHB 19 4.9'S 75° 32.3'W
—					157 deg @ 5.3kt.
120727		3800			tops.
		3100			base.
—					RHB tops 1100m base 750m
—					a little drizzle but not to sfc.
122501	P6	2900			
—					CDP 270 12μm 1SI-1 2DC HF 420 12·8μm. 200μm.
122547	R6	3			CAS 500-600
—					RHB 19 27.36' 75 19.79'
		4100			tops
					P7 cooler & moister than P6.
12576					167 / 3 ms-1 no whitecaps
125718		100			start P8 end R7.
130222		3500			R8 CDP 200 20μm HF 250 20μm
					CAS 450
131209		"			o/h RHB
1320					LWC v. steady along run.
132202		"			end R8 & P8 above.
		3900			tops.
133526					R10 (& R9) reverse hdg legs fr wind clear.
133800		3200	304		R11 start. S-N.
					CDP 160 16-17μm 2DC 301-1 HF 230 16 " 250μm.

20 40l-1 water.

Mission Scientist's Log

M.S.2.

Flight No B419 **Date** 12/11/08 **Name** ..... **Page** 2 **of** 3

Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
1346		3200			LWC very steady again.
134724					o/h RMB. slight LWC peak here.
—					RMB reports steady drizzle
135655		"			end R11 no drizzle
—		2500			on W-band base
140112		2·			start R12 just occas drizzle.
—					CVI 150-200 PCASP
—					600 CPC
1411					note E wind component changing most between headings.
—					SMPS pk 120 nm.
—					winds are roughly alongwind
—					so this consistent with AoSS error
1420					AoA cal, poss slight offset
—					comp. to earlier flights
142140		2200			end 12 — proj - to 50'
—					still 1deg AoSS offset on Horace
142633		100ft	309		R13. Profile shows
—					sfc. layer with higher q_N
—					PCASP 90 — poss OK?
					CVI PCASP 120 CNC 400
—					CAS 80-90 / 120 @ 0.1%
1443					sea salt on screen.
144457		"			end 13 e prof te PB slightly
—					higher winds with few
—					whitecaps

1447

3900 tops.

Prof. 13 is well-mixed mostly, but only up to ~ 2-300 below cloud.

Mission Scientist's Log

M.S.2

Flight No B.449 **Date** 12/11/08 **Name** PHIL BROWN **Page** 3 **of** 3

Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
145552					P13 / P14
151437		3350			R15 cloud skimming.
152155					end 15
		2500			base.
153225		4500			end P17 3600 for in cloud y/c with G1.
154144					run 16 v. poor intercomparison
"					for G1 due to v. thin cloud
"					LWC ~ 0.05 gm^{-3}
					R17 PCASP 180
					CVI 11 240 CPC 650
617					real-time AoA cal definitely
					not as good as earlier in voos.
162906		3350			main top, wispy Cu below.
"					higher sulphate near coast.
					thin decoupled Sc layer.
1635					interesting small patchy
					changes of ocean colour
					— Blankets?
1640					P23/24 — clear 2 layers.

Mission Scientist's Log

Flight No B419 **Date** 12/11/03 **Name** G. ALLEN **Page** 1 **of** 5

Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
10:50	'	0	'	'	Surface conditions : 1008 mb,
					T = 21°C, DP = 8.2°C. Clear sky.
					Can see Sc deck out to sea on
					horizon. Sat pic shows solid Sc deck
					over area of ops.
11:30					T/O towed ROMEO'
11:33.					900 mb = inversion. Top of cloud
					at 3300 ft. CO = 60 ppbV just
					above cloud at 4000 ft.
11:35.	R1	6000 ft	261°	70°48'W	
11.40	P2↓	500 ft.	261°		Down to 500 ft ↓ 3500 ft = CTH
					CB = 2700 ft. 1004.
11:46.	R2	500 ft		71°24.18'30S	Intercomp run 1'
11.50	P3↑	3200 ft			
11.55	R3	3300 ft			In-cloud. 18°36'S. 71°54'W.
					12:47z - RV at RHB.
					CTH = 3600 ft.
12:01.	R4	4600 ft			5. Min run.
12.05.	P5↓				Sea bott - 50 ft to 500 ft for 1 min
					run - CB = 3570, 3100 ft.
12:12.	R5.	500 ft.			10-min run. RHB reports
					(CB = 750 m, CTH = 1100 m.)
12:25.	R6.	3500 ft.			10 min.

Mission Scientist's Log

Flight No B.....419..... **Date** ...12/11/18..... **Name** ...G. ALLEN..... **Page** ...2... **of** ...5...

Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
12:26		3500ft			CDP = 270, Dia = 12μm. - 13μm.
					FSSP = 420-450, Conc =.
					Dia = 15/Libra drizzle → 200μm
					2DS - same. 500-650/cc.
					19° 27.365', 75. 19.179° W
12:36					CTH = 4100ft.
12:38	P3b	50ft.			CTH = 4000ft.
					Core chan reporting NA spikes
					but these are incorrect, similar to
					dual data seen before.
12:47	R7	100ft.			10. RV - with RHB 10 min recip.
					at 100ft.
					076° 00.13' W
					R2 = 19° 29.17° W 075° 01.73' W
					RHB: 11° 38.746'S W 075° 073.09 W
12:57	P9↑				CB = 2800ft. CTH: ?
13:01	R8	3500ft.	127°	75°, 19°18's	In-cloud run at 3500ft 20 mins
					Drizzle - 200μm.
					2DS. CAS: 450/cc sizes 15-70μm.
					0.7-0.9 LWC.
13:22	P10↑	4900ft			1000ft above cloud. 3900ft = CTH.
					5-min reciprocal.
13:25					CO, O_3 spike at 4800ft. Bottom
					of layer though: CO → 70ppbv.
					O_3 > 15 → 40ppbv (3x increase)

Mission Scientist's Log

Flight No B. 49 **Date** 12/11/08 **Name** G. ALLEN **Page** 3 **of** 5

Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
13:38	R11	3200ft	308°	19.55 75W	20-min cloud run. $NO_x \rightarrow 0$ ppb
					Above cloud suggesting that NO_x is
					real below cloud.
					Din = 16μm. FSSP = 230/cc, 16μm.
					Drizzle = 30/litre. 250μm.
					CAS = 400/cc. 14-15μm dia. LWC = 0.3
13:47.	R11	19°6'75°3'	308°	3200ft -	over head 17.47L (RHB)
					AMS reports SO_4 reduction at 13.47L
13:57	P11↓	2200ft			CB = 2500ft.
13:59	R12	2200ft			
14:00	R12	2200ft.	119°	2200ft.	Reversal of wind dir correlated by
					increase in W-wind.
					1-3 μg m^{-3} SO_4 - AMS.
					SMPS - 120nm.
					No change in anything (!) across this
					run. Aerosol, Chem etc all constant.
14:22.	P12↓	50ft	338°	19°30; 75°W	Therm profile down to 50 ft, then up to
					100 ft. No change on run, but
					AMS reports up to ~~200~~. 2 μg m^{-3} SO_4
					on run. - Slightly more than at 2200ft.
14:35			308°		RHB overpass time.
14:44	P13↑	10000ft -			2700ft CB. 3900ft CTH.
					Pollution layer at 4400ft.
					All the way up to 10000ft
					CO peaks at 73ppb, O_3 → 40ppb

Mission Scientist's Log

Flight No B. 419 **Date** 12/11/05 **Name** G. ALLEN **Page** 4 **of** 5

Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
14:55.		10000ft	177°		Pollution layer all the way to 10000ft
					before returning to background levels.
15:01.	R14	6000ft			Correlation between ∈-mini and
					CO.
15:15	R15	3850ft			Turbulence measurements.
15:19.	R15	~~3700~~	308°		Peaks up to -1 ms⁻¹ or -2 ms⁻¹
					15:21 (over RHB).
15:22	P16↑				Move toward GOLF.
					CB = 2500ft. CTH = 3900ft.
15:40	R16	3600ft.	60°		In-cloud run first due to coastal
		4300ft.		18°36', 74°42'	clearance. Entering CO layer at pos'n
15:46	R16.	3450ft	92°	18°30', 74°30'	CO → 62 ppb. O_3 → 40 ppbv.
					COP = 0-300. dia 10μm. FSSP-300
					0μm. 5 /litre derived 75μm.
					Very difficult to stay in cloud.
					Right on edge of coastal light area.
					Thin / broken cloud.
15:52	P19↓	1000ft	92°	18.5°S - 73°42'W	Sub-cloud aerosol run (10 min)
					AMS: 5μg SO_4 0.7μg Org.
					CPC - 700/cc. CCN 250→25 at
					0.2%. ~~PCASP~~.
					Tephi shows offset on profile ascent
16:05					in-line with increasing SST seen
					by Heimann.

Mission Scientist's Log

Flight No B. 419 **Date** 12/11/08 **Name** G. ALLEN **Page** 5 **of** 5

Time (GMT)	Run / Profile	Height	Hdg	GPS Position	Remarks / Observations (cloud type & amount in oktas, weather, visibility, winds, sea state etc.) eg Cirrus 2/8, StratoCu 3/8, hazy, wind 240°/24kts
16.10.	R18	4500ft	037°		Slightly increasing neph trace as we approach coast.
					16:05 - decrease in CO, increase in O_3, increase in Neph and AMS, correlated with change in wind direction toward north-easterly dir.
					CPC; decrease CN 10nm → 5nm.
					Fresh emission with increase in small particles.
16:31.	P22				Saw-toothing between 50ft and 6500ft, change in wind straight above boundary layer.
					CTH = 3400ft. Still thin cloud.

Chemisty Log

Date: 12/11/08 Flight: B419 Operator: KFT

Preflight CO, O_3, NO_x, SO_2 operated.

No.	? or x	Location	Action	Comments
		Gases		
1	✓	CO_2/Ar	Outlet pressure is between 2 2.5 bar	110
2	✓	CO_2/Ar	Inlet pressure not less than 20 psi	
3	✓	CO standard	Outlet pressure is between 2 2.5 bar	
4	✓	CO standard	Inlet pressure not less than 20 psi, note pressure	40
5	✓	Nitrogen	Outlet pressure is between 2 2.5 bar	
6	✓	Nitrogen	Inlet pressure not less than 20 psi, note pressure	15
		Flows		
7	✓	Ozone sample flows	Flow ~ 0.7 LPM on both channels	
8	✓	NOx sample flow	~ 1 LPM	
9	✓	NOx Ozonator flow	~ 0.065 LPM	
10	✓	CO lamp flow	~ 40 ml/min	
11	✓	CO cell pressure	~ 7.5 bar	
12	✓	CO Pressure monochromator	~ 5 bar	
		Zeros		
13	✓	Ozone zero	Performed OK (if not approx zero note values)	
14	✓	NOx zero	Performed OK (if not approx zero note values)	
15	✓	CO zero	Left for approx 10 min	
		Other		
16	✓	Tubing	All inlets / exhausts connected	
17	✓	HORACE data	Check data is being displayed and recorded	
18	X	CO calibration	If unattended set to auto cal (40 min)	Manual valve turns
		CO clock checked.		
		TDLAS		
19	X	230V	230V power breakers on	
20	X	28V	Red LED on front panel (ensure LTI breaker on)	
21	X	Laptop	On and software working	
22	X	Data	Being saved to correct directories	

Post Flight

		Switch off		
1	✓	CO	Switch off instrument	
2	✓	Ozone	Switch off monitor	
3	✓	NOx	Switch off monitor	
4	✓	Pumps	Switch off all pumps	
5	✓	Breaker	Pop all breakers on rack and SSP	
		Gases (note pressures)		
6	✓	CO_2/Ar	Close valves and check inlet pressure not below 20 psi	160
7	✓	CO standard	Close valves and check inlet pressure not below 20 psi	40
8	✓	Nitrogen	Close valves and check inlet pressure not below 20 psi	8
		If below 20 psi then the cylinder needs changing refilling		
		Driers		
9	✓	Small drier	Change if spent	
10	✓	Large drier	Change if spent	
		TDLAS		
11	X	Data transfer	To memory stick	
12	X	Laptop	Shut down	
13	X	Switch off instrument	Pull all breakers IF no other instrument on	
		Log		
14	✓	Flight Log	Put log in folder (notify Ruth of any issues)	
15	✓	Faults	Fill out separte log for in flight issues put in flight folder	
16	✓	TDLAS data	Send to project spaces on BADC	

Chemisty Log

B419. In flight

CO calibrations only need carrying out when the lamp temperature changes, if unsure perform a quick cal first.

During each CO calibration check Ozone and NOx flows are similar to those observed pre-flight

Time	Flight level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgrd Count (Hz)	Lamp Temp (deg C)	Cell Pressure (Torr)
11:30	Taxy	93.34	301	28093	38.79	7.51

Time	Flight level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgrd Count (Hz)	Lamp Temp (deg C)	Cell Pressure (Torr)

Time	Flight level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgrd Count (Hz)	Lamp Temp (deg C)	Cell Pressure (Torr)

CO 'Cal'

Flight level	Zero Start	Zero End	Counts (Hz)	Span Start	Span End	Conc. Range	Counts range	Sensitivity	Bkgrd (ppbV)	Bkgrd Count (Hz)	Pressure Cell (Torr)	Lamp Temp	O3 Intensities
3400FT.	12:25	-2ppb	27700	12:26		519	76800				7.53	38.48	115kHz
4800FT	13:29	-4ppb.	27700	13:30		518	76300				7.52	38.16	112kHz
3900FT.	15:12	-6ppb	27500	15:13		516	76200				7.53	38.13	112kHz
4400FT	16:09	-6ppb	27300			512	75900				7.53	38.46	114kHz
Taxy	16:53	-4ppb	27600			518	76000				7.53	38.96	114kHz

		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgrd Count (Hz)	Lamp Temp (deg C)	Cell Pressure (Torr)

In flight comments

CLOUD PHYSICS LOG Flight B 419

Date: 12/11/08	Operator: MAP	DRS Time: 09:00	DAU1 Time: +0	DAU2 Time: +0	DAU3 Time: +0	Aux1 Time: +0	Aux2 Time: +0	Page 1 of 5

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		Manchester FSSP		CIP25			CDP			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Mean Dia	Conc m3	Max size	LWC	Conc m3	Mean Dia	LWC		
11:32:45	40	0.07	2														FL030
11:33:35	110	0.07															FL040
11:35:07	20	0.07															FL050
11:36:30	20	0.07															End of P & Start Run @ FL060
11:40:11	10	0.07															End of Run 1 & Start P2
11:41:59	20	0.07															FL040
11:43:15	70	0.12															FL030
11:44:22	150	0.12	153														FL020
11:45:30	170	0.12															FL010
11:46:27																	End of Profile 2 & Start Run 2 @ 500’
11:47:00	170	0.07															CDP to manual value
11:49:00	200	0.07															
11:51:30																	End of Run 2 & Start P3
11:52:17	90	0.07															FL010
11:53:30	80	0.07															FL020
11:54:57	60	0.08	214			6		400	10			0.2	200	10	0.1	12	End of P3 & Start Run 3 @ 3300’
11:57:00	70	0.11	416			10	100	270	11			0.2	200	11	0.1	12	
11:59:00	65	0.12	626			3	100	325	12			0.2	200	11	0.1	12	
12:00:14																	End of Run & Start P4
12:01:00	20	0.07	737														
12:03:00	5	0.07															
12:05:00	10	0.07															
12:06:36																	End of Run & Start P5
12:07:11	5	0.07															FL040
12:08:12	5	0.07															FL030
12:09:13	90	0.07	823														FL020
12:10:22	100	0.07															FL010
12:11:46																	End of P & Start Run 5 @ 500’
12:12:00	130	0.07															
12:14:00	140	0.07															
12:16:00	220	0.07															
12:18:00	200	0.07															
12:20:00	160	0.07															
12:22:18																	End of Run & Start P6
12:22:57	190	0.07	824														FL010
12:24:04	140	0.07															FL020
12:25:42																	End of P & Start Run 6 @ 3500’
12:26:00	60	0.15	1093			15	125	400	12			0.3	250	13	0.3	12	
12:29:00	130	0.16	1415			10	125	600	14			0.45	300	14	0.4	12	
12:31:00			FAIL														
12:32:00	90	0.16	97			6	100	700	14			0.4	350	14	0.35	12	
12:34:00	130	0.16	500			20	100	600	15			0.45	300	14	0.40	12	
12:36:06																	End of Run & Start P7

PCASP Reference Volts = 8.2V	FFSSP Reference Volts =3.4V	2D2-C End element 1 voltage = -1.6V	CIP25 End element 1 voltage = 0.7V	CIP100 End element 1 voltage = n/a
PCASP Flow rate = 1.9CC/sec		2D2-C End element 32 voltage = -2.2V	CIP25 End element 64 voltage = 0.7V	CIP100 End element 64 voltage = n/a
	SID2 Laser power = n/a	2D2-P End element 1 voltage = n/a		

CLOUD PHYSICS LOG Flight B 419

Date: 12/11/08	Operator: MAP	DRS Time: 09:00	DAU1 Time: +0	DAU2 Time: +0	DAU3 Time: +0	Aux1 Time: +0	Aux2 Time: +0	Page 2 of 5

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		Manchester FSSP		CIP25			CDP			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Mean Dia	Conc m3	Max size	LWC	Conc m3	Mean Dia	LWC		
12:37:46	10	0.07															End of P7 & Start P8 @ FL050
12:38:44	5	0.07	1024														FL040
12:39:49	130	0.18	1198			25	175	300	18			0.8	200	18	0.6		FL030
12:42:02	180	0.08	1216														FL010
12:44:30	130	0.07															End of P @ 50’
12:44:40																	Start Run 7 @ 100’
12:45:00	110	0.07															
12:47:00	60	0.07															
12:49:00	80	0.07															
12:51:00	65	0.07	1217														
12:53:00	65	0.07															
12:57:18																	End of Run & Start P9
12:58:34	110	0.07															FL010
12:59:40	90	0.07															FL020
13:00:55																	End of P @ FL034
13:02:24																	Start Run 8 @ FL034
13:03:00	170	0.17	1635			25	125	280	18			0.5	200	19	0.6	12	
13:05:00	180	0.18	1964			45	175	300	18			0.6	200	19	0.6	1	
13:07:00	180	0.19	2293			20	225	225	18			0.6	190	19	0.6	1	
13:09:00	150	0.18	2540			15	200	250	19			0.55	190	20	0.6	1	
13:11:00	130	0.18	2746			20	100	275	19			0.5	190	20	0.7	12	
13:13:00	160	0.18	3100			15	100	350	19			0.6	210	20	0.8	12	
13:15:00	180	0.19	3427			16	150	260	18			0.55	200	20	0.6	1	
13:17:00	170	0.19	3609			35	250	220	19			0.55	170	20	0.6	1	
13:19:00	160	0.18	3857			35	200	270	19			0.5	170	19	0.6	1	
13:22:00																	End of Run & Start P10
13:23:50																	End of P10 & Start Run 9 @ 4800’
13:24:00	2	0.07															
13:30:27																	End of Run 9 & Start Run 10 @ 4800’
13:35:32																	End of Run 10
13:38:03																	Start Run 11 @ 3200’
13:39:00	100	0.19	4562			20	200	250	17			0.4	200	15	0.35	1	
13:41:00	70	0.19	4879			35	200	220	16			0.35	160	16	0.35	1	
13:43:00	90	0.19	5109			35	225	240	17			0.3	160	16	0.4	1	
13:47:00	120	0.20	5543			30	200	270	17			0.3	160	16	0.35	1	
13:49:00	80	0.19	5738			35	200	220	17			0.3	170	16	0.35	1	
13:51:00	100	0.17	5964			40	200	260	16			0.3	170	16	0.35	1	
13:53:00	100	0.18	6174			30	200	250	17			0.3	170	16	0.35	1	
13:55:00	75	0.18	6394			5	275	250	16			0.2	160	15	0.3	1	
13:56:55																	End of Run
13:57:32																	Start P11 from 3200’
13:58:42																	End of P @ 2200’
14:01:13																	Start Run 12 @ 2200’

PCASP Reference Volts = 8.2V	FFSSP Reference Volts =3.4V	2D2-C End element 1 voltage = -1.6V	CIP25 End element 1 voltage = 0.7V	CIP100 End element 1 voltage = n/a
PCASP Flow rate = 1.9CC/sec		2D2-C End element 32 voltage = -2.2V	CIP25 End element 64 voltage = 0.7V	CIP100 End element 64 voltage = n/a
	SID2 Laser power = n/a	2D2-P End element 1 voltage = n/a		

CLOUD PHYSICS LOG Flight B 419

Date: 12/11/08	Operator: MAP	DRS Time: 09:00	DAU1 Time: +0	DAU2 Time: +0	DAU3 Time: +0	Aux1 Time: +0	Aux2 Time: +0	Page 3 of 5

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		Manchester FSSP		CIP25			CDP			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Mean Dia	Conc m3	Max size	LWC	Conc m3	Mean Dia	LWC		
14:02:00	70	0.07	6685			2											
14:04:00	90	0.07				3	250									1	
14:06:00	100	0.07															
14:08:00	70	0.07				2	250									1	
14:10:00	70	0.07				2	300									1	
14:12:00	80	0.07				2	200									1	
14:14:00	80	0.07	6686			1	200									1	
14:16:00	100	0.07				3	250									1	
14:18:00	120	0.07	6687			1	225									1	
14:20:00	100	0.07				3	250									1	
14:21:41																	End of Run & Start P12
14:22:03	130	0.07															FL020
14:23:55	110	0.07															FL010
14:26:33	150	0.07															End of Profile 12 @ 50’
14:26:45																	Start Run 13 @ 100’
14:27:00	100	0.07															
14:29:00	120	0.07															
14:31:00	90	0.07															
14:33:00	90	0.07	6688														
14:35:00	370	0.07															
14:37:00	90	0.07															
14:39:00	100	0.07															
14:41:00	70	0.07															
14:43:00	110	0.07															
14:45:02																	End of Run & Start Profile 13
14:46:01	65	0.07	6689														FL010
14:47:00	65	0.07				3	250									1	FL020
14:48:07	36	0.09	6724			50	225	260	15			0.45	150	16	0.3	1	FL030
14:49:15	10	0.07	6785														FL040
14:50:18	10	0.06															FL050
14:51:30	5	0.07	6786														FL060
14:52:35	2	0.07															FL070
14:54:54	2	0.07	6866														FL090
14:55:55	2	0.07															End of P13 & Start P14 from FL100
14:57:15	5	0.07															FL090
14:58:18	5	0.07															FL080
14:59:24	2	0.07															FL070
15:00:39																	End of P14 & Start Run 14 @ 6000’
15:01:00	2	0.07															
15:03:00	2	0.07															
15:05:00	2	0.07															
15:07:00	2	0.07															
15:08:26																	End of Run 14

PCASP Reference Volts = 8.2V	**FFSSP Reference Volts =3.4V**	**2D2-C End element 1 voltage = -1.6V**	**CIP25 End element 1 voltage = 0.7V**	**CIP100 End element 1 voltage = n/a**
PCASP Flow rate = 1.9CC/sec		**2D2-C End element 32 voltage = -2.2V**	**CIP25 End element 64 voltage = 0.7V**	**CIP100 End element 64 voltage = n/a**
© Met Office 2007	**SID2 Laser power = n/a**	**2D2-P End element 1 voltage = n/a**		

CLOUD PHYSICS LOG Flight B 419

Date: 12/11/08	Operator: MAP	DRS Time: 09:00	DAU1 Time: +0	DAU2 Time: +0	DAU3 Time: +0	Aux1 Time: +0	Aux2 Time: +0	Page 4 of 5

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		Manchester FSSP		CIP25			CDP			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Mean Dia	Conc m3	Max size	LWC	Conc m3	Mean Dia	LWC		
15:09:47																	Start Profile 15
15:11:49	3	0.06															FL040
15:12:01																	Start Run 15 @ FL038
15:14:00	3	0.07															
15:16:00	50	0.07	6889			10	75	100	19			0.6	150	19	0.5	12	
15:18:00	75	0.17	7037			25	150	170	18			0.5	140	20	0.45	1	
15:20:00	90	0.17	7230			50	175	160	18			0.5	130	21	0.45	1	
15:21:54																	End of Run & Start P16
15:22:51	65	0.08	7492			20	200	220	12			0.25	140	12	0.3	1	FL030
15:24:12	90	0.07	7508			2	200									1	FL020
15:25:36	100	0.07	7508														FL010
15:28:00	100	0.07															End of P16 & Start P17 @ 50’
15:29:09	75	0.07															FL010
15:30:11	60	0.07															FL020
15:30:59	60	0.07															FL030
15:31:50	2	0.06															FL040
15:32:26	2	0.09															End of P @ 4500’
15:40:38																	Start P18
15:41:49																	End of P18 & Start Run 16 @ 3800’
15:42:00	10	0.08	7654					350	10			0.3	200	10	0.05		
15:44:00	60	0.08	7764			7	75	200	12			0.1	180	11	0.1	12	
15:46:00	100	0.07															
15:48:00	100	0.08	7879			1		300	10			0.05	200	10	0.05		
15:50:00	50	0.07	7881														
15:51:41																	End of Run & Start P19
15:52:12	200	0.07															FL030
15:53:30	150	0.07	7882														FL020
15:55:07																	End of P19 & Start Run 17 @ 1000’
15:56:00	190	0.07															
15:58:00	180	0.07															
16:00:00	180	0.07															
16:02:00	150	0.07	8002														
16:04:00	100	0.07															
16:05:11																	End of Run & Start P20
16:06:19	80	0.07															FL020
16:07:29	50	0.08	8027														FL030
16:08:38	20	0.08															FL040
16:09:10																	End of P & Start Run 16 @ FL044
16:10:00	60	0.08															
16:12:00	40	0.07	8032														
16:14:00	50	0.07															
16:16:00	25	0.07															
16:18:00	5	0.07															

PCASP Reference Volts = 8.2V	**FFSSP Reference Volts =3.4V**	**2D2-C End element 1 voltage = -1.6V**	**CIP25 End element 1 voltage = 0.7V**	**CIP100 End element 1 voltage = n/a**
PCASP Flow rate = 1.9CC/sec		**2D2-C End element 32 voltage = -2.2V**	**CIP25 End element 64 voltage = 0.7V**	**CIP100 End element 64 voltage = n/a**
	SID2 Laser power = n/a	**2D2-P End element 1 voltage = n/a**		

CLOUD PHYSICS LOG Flight B 419

Date: 12/11/08	Operator: MAP	DRS Time: 09:00	DAU1 Time: +0	DAU2 Time: +0	DAU3 Time: +0	Aux1 Time: +0	Aux2 Time: +0	Page 5 of 5

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		Manchester FSSP		CIP25			CDP			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Mean Dia	Conc m3	Max size	LWC	Conc m3	Mean Dia	LWC		
16:19:20																	End of Run & Start P21
16:19:55	20	0.07															FL040
16:21:02	160	0.07															FL030
16:22:05	190	0.07															FL020
16:23:15	190	0.07															FL010
16:25:24	200	0.07															End of P21 & Start P22 @ 50’
16:26:20	180	0.07															FL010
16:27:56	110	0.07															FL020
16:28:54	20	0.07	8046			5	75									12	FL030
16:30:02	20	0.07	8050														FL040
16:31:00	5	0.07															FL050
16:32:29	70	0.07															FL040
16:33:35	130	0.07	8077			1	50									12	FL030
16:34:45	220	0.07															FL020
16:36:00	210	0.07															FL010
16:37:24	270	0.07															End of P22 & Start P23 @ 500’
16:38:01	120	0.07															FL010
16:39:14	80	0.07															FL020
16:40:18	10	0.07															FL030
16:41:21																	FL040
	PCASP Leak problems. Conc relative. FFSSP Hard disk failuire once during flight																

PCASP Reference Volts = 8.2V	FFSSP Reference Volts =3.4V	2D2-C End element 1 voltage = -1.6V	CIP25 End element 1 voltage = 0.7V	CIP100 End element 1 voltage = n/a
PCASP Flow rate = 1.9CC/sec		2D2-C End element 32 voltage = -2.2V	CIP25 End element 64 voltage = 0.7V	CIP100 End element 64 voltage = n/a
	SID2 Laser power = n/a	2D2-P End element 1 voltage = n/a		

P.S.A.P. Log

Flight No. **B419** Date 12/11/2008 Page 1 of .. operator

GMT	Filter Trans.	Flow Rate	B_a x 10^{-6}	Ph_det levels		Run	Remarks
Set to DRS time: done 074920Z	New filter Tr = 1.000 done	Set to 3.0 lpm: N/A				Ave =30 s	←Preflight
11:45	.990					r2	pump on
11:53	.988					p3	pump off
12:01	.994					r4	pump on
12;06	.993						pump off
12:09	.985						pump on
12:22	.982					p6	pump off
12:41	.982					p8	pump on
r7						r7 100ft	pump on
12:57	.978					p9	pump off
13:22	.979					p10	pump on
13:37	.981					r10	pump off
13:58	.977					p11	pump on
14:47	.968					p13	pump off
14:54	.981					p13	pump on
15:16	.970					r15	pump off, maybe bit late, cloud top run already started
15:24	.966					p16	pump on
15:;40	.980??						pump off
15:52	.965					p19	pump on
16;05	.960						pump off
16:10	.966						pump on
16:40							pump on off
16:59	.953					on ground	

Flight No: B419 **Date: 12/11/2008** **Operator:JB**

Type of filters mounted in	Upper inlet:	Lower inlet:

Disk No 1 (top)	Disk No 2 (middle)	Disk No 3 (bottom)	Inlet Upper/ Lower	Time Pump On	Time Pump Off	Run	Accum Vol [l]	Comments eg. Filter Exposure No, period in cloud, change of level etc.
3	4	49	u	12:17	12:23	r5	322	
10	69	140	u	12:48	12;57	r7	530	past ron brown before 5 min filter drying time.
1	2	117	u	14:04	14:46	r12 r13	2277	just below cloud base
33	40	no No.	u	15:02	15:09	r14	257	
21	23	83	u	15:56	16:05	r17	504	
7	8	152	u	16:10	16:38		2	blank

Size	#	charged	Flight/Date	Discharged	Comments
10	1	KNB	B419	12/11	
1	2	11/11	12/11	KNB	
10	3	KNB	B419	12/11	
1	4	11/11	12/11	KNB	
10	7	KNB	B419	12/11	
1	8	11/11	12/11	KNB	
10	10	KNB	B419	12/11	
1	69	11/11	12/11	KNB	
10	21	KNB	B419	12/11	
1	23	11/11	12/11	KNB	Wet
10	33	KNB	B419	12/11	
1	40	11/11	12/11	KNB	

Filter #	Loc^N	Ton	Toff	RUN	TOTAL VOL	
3, 4, 49	U	12:17	12.23	R5	322	-
10, 69, 140	U	12.48	12:57	R7	530 <	past RonBaun before 5min filter closing time
1, 2, 117	U	14:04	14:46	R112 R13	2277	- just below CB
33, 40, —	U	15:02	15.09	R14	257	-
21, 20 ~~83~~	U	15:56	16.05	R17	504	-
7 8 152	U	16:10	16:34		2	BLANK

CVI log

11/12/08 10:07:20 AM
11/12/08 10:07:24 AM
11/12/08 10:07:29 AM
11/12/08 10:07:49 AM change the display
11/12/08 10:07:58 AM set up counterflow to dry the circuit
11/12/08 10:45:18 AM first lyman zero
11/12/08 10:45:29 AM lyma has just been turned on
11/12/08 10:45:41 AM LyI0=0.64
11/12/08 10:48:32 AM LyI0=0.64
11/12/08 10:48:39 AM LyI0=0.64
11/12/08 10:48:42 AM LyI0=0.64
11/12/08 10:48:45 AM LyI0=0.64
11/12/08 10:50:25 AM LyI0=1.82
11/12/08 10:57:36 AM LyI0=19.2
11/12/08 10:58:03 AM increase dilution factor, zero lyman alpha
11/12/08 10:58:12 AM increase dilution factor, zero lyman alpha
11/12/08 10:59:51 AM increase dilution factor, zero lyman alpha
11/12/08 10:59:56 AM increase dilution factor, zero lyman alpha
11/12/08 10:59:59 AM increase dilution factor, zero lyman alpha
11/12/08 11:00:05 AM increase dilution factor, zero lyman alpha
11/12/08 11:00:07 AM increase dilution factor, zero lyman alpha
11/12/08 11:00:10 AM increase dilution factor, zero lyman alpha
11/12/08 11:03:01 AM increase dilution factor, zero lyman alpha
11/12/08 11:03:05 AM increase dilution factor, zero lyman alpha
11/12/08 11:03:08 AM increase dilution factor, zero lyman alpha
11/12/08 11:03:11 AM increase dilution factor, zero lyman alpha
11/12/08 11:03:19 AM increase dilution factor, zero lyman alpha
11/12/08 11:36:41 AM final lyman zero
11/12/08 11:36:48 AM lyman to sample
11/12/08 11:40:20 AM keep counterflow on until below cloud
11/12/08 11:40:23 AM keep counterflow on until below cloud
11/12/08 11:40:29 AM keep counterflow on until below cloud
11/12/08 11:40:44 AM keep counterflow on until below cloud
11/12/08 11:41:34 AM keep counterflow on until below cloud
11/12/08 11:42:24 AM can't seem to get a decent zero on anymore
11/12/08 11:43:05 AM can't seem to get a decent zero on anymore
11/12/08 11:43:13 AM can't seem to get a decent zero on anymore
11/12/08 11:46:27 AM cvi into zerosol mode
11/12/08 11:47:06 AM cvi into zerosol mode
11/12/08 11:50:02 AM tip is very warm 40deg
11/12/08 11:52:32 AM tip is very warm 40deg
11/12/08 11:54:47 AM in counterflow cloud thin ams on counterflow
11/12/08 11:56:23 AM in counterflow cloud thin ams on counterflow
11/12/08 11:56:31 AM in counterflow cloud thin ams on counterflow
11/12/08 11:56:38 AM in counterflow cloud thin ams on counterflow
11/12/08 11:56:51 AM in counterflow cloud thin ams on counterflow
11/12/08 11:56:57 AM in counterflow cloud thin ams on counterflow
11/12/08 11:57:00 AM in counterflow cloud thin ams on counterflow
11/12/08 12:01:14 PM back to aerosol mode now
11/12/08 12:01:26 PM ams says cvi worked well on that run
11/12/08 12:03:42 PM ams says cvi worked well on that run
11/12/08 12:03:44 PM ams says cvi worked well on that run
11/12/08 12:04:28 PM ams says cvi worked well on that run
11/12/08 12:06:45 PM turn lyman to reference air for cloud passage
11/12/08 12:09:14 PM counterflow is off, turn lyman back to sample plenum air
11/12/08 12:13:12 PM sub cloud aerosol - cpc=640, cnc-cpc=612
11/12/08 12:24:06 PM 1000ft below, into counterflow mode
11/12/08 12:24:13 PM 1000ft below, into counterflow mode
11/12/08 12:24:18 PM 1000ft below, into counterflow mode
11/12/08 12:26:09 PM 1000ft below, into counterflow mode
11/12/08 12:28:48 PM 1000ft below, into counterflow mode
11/12/08 12:32:16 PM leave in counterflow mode above cloud to see if we get a zero or not - cut the ams flow if needed
11/12/08 12:35:04 PM plenum pressure is 80mb higher than ambient
11/12/08 12:36:27 PM plenum pressure is 80mb higher than ambient
11/12/08 12:36:30 PM ams gone
11/12/08 12:36:33 PM cloud top

11/12/08 12:37:48 PM still can't get a zero
11/12/08 12:38:20 PM still can't get a zero
11/12/08 12:38:44 PM might be attitude dependant, or pressure dependant
11/12/08 12:40:18 PM below cloud, into aerosol mode
11/12/08 12:40:33 PM still seeing some drizzle
11/12/08 12:41:52 PM out of drizzle now
11/12/08 12:41:59 PM use 2dc in the processing?
11/12/08 12:42:23 PM use 2dc in the processing?
11/12/08 12:42:54 PM use 2dc in the processing?
11/12/08 12:43:07 PM use 2dc in the processing?
11/12/08 12:59:50 PM ito cvi mode
11/12/08 1:00:00 PM well mixed clean boundary layer
11/12/08 1:00:12 PM into cloud
11/12/08 1:01:48 PM into cloud
11/12/08 1:01:53 PM into cloud
11/12/08 1:01:56 PM into cloud
11/12/08 1:03:36 PM into cloud
11/12/08 1:12:24 PM into cloud
11/12/08 1:12:29 PM into cloud
11/12/08 1:15:57 PM into cloud
11/12/08 1:16:02 PM into cloud
11/12/08 1:16:42 PM very low pcasp counts
11/12/08 1:16:55 PM very high cpc counts
11/12/08 1:17:12 PM strange blip halfway throught the run, a step change
11/12/08 1:22:53 PM into aerosol mode for above cloud legs
11/12/08 1:23:06 PM will do reciprocal slr for wind cal
11/12/08 1:33:09 PM try and get a zero again
11/12/08 1:34:16 PM just about got a zero
11/12/08 1:37:13 PM are we getting drizzle shattering?
11/12/08 1:40:21 PM are we getting drizzle shattering?
11/12/08 1:46:33 PM are we getting drizzle shattering?
11/12/08 1:47:59 PM gettung bumpy, lwc increasing
11/12/08 1:48:05 PM drop conc increasing
11/12/08 1:55:31 PM blip may be when the aircraft passed over the ron brown, simililar signals from others, including a drop, a DROP in so2 from ams, increase in lwc from others,
11/12/08 1:56:15 PM cloud base very smooth indicTING weak large scale motions - message from ron brown
11/12/08 1:58:02 PM ams off
11/12/08 1:58:14 PM cvi into aerosol mode at cloud base 2.5kft
11/12/08 1:58:59 PM 300ft below cloud base leg
11/12/08 1:59:29 PM 300ft below cloud base leg
11/12/08 1:59:38 PM 300ft below cloud base leg
11/12/08 1:59:41 PM 300ft below cloud base leg
11/12/08 2:00:02 PM 300ft below cloud base leg
11/12/08 2:00:05 PM 300ft below cloud base leg
11/12/08 2:00:52 PM wind peak with upward velocity. we see an increase in cpc counts
11/12/08 2:01:32 PM drizzle
11/12/08 2:02:47 PM 1-3 mu g of sulphate today
11/12/08 2:03:40 PM 1-3 mu g of sulphate today
11/12/08 2:03:46 PM 1-3 mu g of sulphate today
11/12/08 2:03:48 PM 1-3 mu g of sulphate today
11/12/08 2:04:11 PM 1-3 mu g of sulphate today
11/12/08 2:04:21 PM 1-3 mu g of sulphate today
11/12/08 2:08:11 PM LyI0=1.95
11/12/08 2:10:17 PM very well mixed day
11/12/08 2:12:41 PM smps - mono modal accumulation mode aerosol
11/12/08 2:20:38 PM aerosol legs are mind-numbing
11/12/08 2:21:30 PM all aerosol and no cloud makes jack a...
11/12/08 2:23:07 PM banking now
11/12/08 2:23:14 PM cpc=cpc-cnc
11/12/08 2:23:36 PM cpc=cpc-cnc
11/12/08 2:23:40 PM cpc=cpc-cnc
11/12/08 2:29:21 PM cpc=cpc-not well mixed bl, break from adiabatic line, change in mixing ratio, small adiabatic laye at 980, lower level bl here
11/12/08 2:35:43 PM cpc=cpc-not well mixed bl, break from adiabatic line, change in mixing ratio, small adiabatic laye at 980, lower level bl here
11/12/08 2:35:46 PM cpc=cpc-not well mixed bl, break from adiabatic line, change in mixing ratio, small adiabatic laye at 980, lower level bl here

11/12/08 2:36:40 PM bog spike from 500-2500 on cpcs as we pass the ron brown
11/12/08 2:38:48 PM bog spike from 500-2500 on cpcs as we pass the ron brown
11/12/08 2:41:12 PM how long does it take to mix a boudary layer given certain profile , SST?
11/12/08 2:41:24 PM
11/12/08 2:46:42 PM
11/12/08 2:47:08 PM
11/12/08 2:47:12 PM
11/12/08 2:47:16 PM
11/12/08 2:47:19 PM
11/12/08 2:47:33 PM increase on cpc, pcasp - drizzle?
11/12/08 2:47:42 PM lyman oto reference
11/12/08 2:48:54 PM cloud top now 3.9kft
11/12/08 2:49:01 PM cloud top now 3.9kft
11/12/08 2:49:08 PM cloud top now 3.9kft
11/12/08 2:50:27 PM still banking
11/12/08 2:55:40 PM zero lyman
11/12/08 3:07:28 PM zero lyman
11/12/08 3:07:35 PM zero lyman
11/12/08 3:08:04 PM zero lyman again
11/12/08 3:08:30 PM lyman back to sample
11/12/08 3:10:39 PM into counterflow mode
11/12/08 3:10:46 PM ams into cvi
11/12/08 3:11:10 PM ams into cvi
11/12/08 3:11:16 PM ams into cvi
11/12/08 3:11:57 PM correlation east wind and CO
11/12/08 3:12:05 PM skimming cloud top at 4.0kft
11/12/08 3:14:37 PM ams onto rosemount, we stay in cvi
11/12/08 3:14:41 PM ams onto rosemount, we stay in cvi
11/12/08 3:15:03 PM ams onto rosemount, we stay in cvi
11/12/08 3:15:05 PM ams onto rosemount, we stay in cvi
11/12/08 3:15:10 PM ams onto rosemount, we stay in cvi
11/12/08 3:15:17 PM ams onto rosemount, we stay in cvi
11/12/08 3:15:43 PM ams onto rosemount, we stay in cvi
11/12/08 3:16:51 PM ams onto rosemount, we stay in cvi
11/12/08 3:16:56 PM ams onto rosemount, we stay in cvi
11/12/08 3:17:08 PM ams onto rosemount, we stay in cvi
11/12/08 3:17:53 PM ams onto rosemount, we stay in cvi
11/12/08 3:19:27 PM ams onto rosemount, we stay in cvi
11/12/08 3:22:38 PM ams onto rosemount, we stay in cvi
11/12/08 3:22:42 PM ams onto rosemount, we stay in cvi
11/12/08 3:22:47 PM ams onto rosemount, we stay in cvi
11/12/08 3:22:52 PM ams onto rosemount, we stay in cvi
11/12/08 3:23:05 PM leave in cvi until well below cloud for any drizzle
11/12/08 3:23:32 PM
11/12/08 3:23:38 PM
11/12/08 3:24:30 PM
11/12/08 3:24:36 PM
11/12/08 3:27:55 PM into aerosol mode for climb
11/12/08 3:30:51 PM lyman to reference
11/12/08 3:32:07 PM lyman to cvi, inton cvi mode
11/12/08 3:32:19 PM ams onto cvi for cloud run
11/12/08 3:40:15 PM ams onto cvi for cloud run
11/12/08 3:40:45 PM ams onto cvi
11/12/08 3:40:48 PM ams onto cvi
11/12/08 3:41:26 PM cloud top 3.8, start of intercomparison with g1
11/12/08 3:41:34 PM hitting cloud base,
11/12/08 3:42:58 PM nudge to 3.5
11/12/08 3:47:40 PM nudge to 3.5
11/12/08 3:47:45 PM nudge to 3.5
11/12/08 3:47:51 PM nudge to 3.5
11/12/08 3:47:57 PM nudge to 3.5
11/12/08 3:52:17 PM descend to sub cloud aerosol leg level
11/12/08 3:52:23 PM turn off counterflow
11/12/08 3:54:55 PM turn off counterflow
11/12/08 3:54:59 PM turn off counterflow
11/12/08 4:05:17 PM start above cloud run
11/12/08 4:08:59 PM above bl run
11/12/08 4:11:57 PM above bl run

11/12/08 4:41:40 PM counterflow on to land

ARIES flight log

Flight: B419 | page 1 of 2

Date: 12/Nov/2008 | Operator(s): S. Rogers | Res: 1 | Gain A: 2 B: 2

Loc./Notes: VOCALS

Scans: either "[IGMs]X[co-adds]", or "[stop DRS time]" if in start/stop, or "[macro name]". View: mirror angle.

DRS time	Flt ptrn	Scans	View	Shtr	HBB	CBB	Comments
~0948	On the ground						Power on OK.
10 55	"		CH	C	71	31	ColdHotImin.scrpt
11 30	Take Off		—	C	71	31	—
11 36 19	6000ft?		NZ	O	71	31	Nad Zen LongRun 30sec. 8/8 Sc below Ci above?
11 40 11	P2↓						6000ft → 5000ft
11 44 47	5000ft	R2	NZ	O	71	33	Nad Zen LongRun 3min Below cloud but still a bit bumpy.
1151	P3↑		—	C	71	32	5000ft → 3200ft
11 56 40	3200ft		CH	C	71	32	ColdHotImin In cloud
12 01 20	4600ft		NZ	O	71	31	Nad Zen LongRun 3min Above cloud 8/8 Sc
12 06 37	P↓		—	C	71	30	4600ft → 5000ft.
12 11 44	5000ft		NZ	O	71	31	Nad Zen LongRun 3min
12 22 29	↑		—	C	71	31	5000ft → 3500ft
12 25 44	3500ft		CH	C	71	31	ColdHotImin In cloud
12 31 58	"		CH	C	71	31	ColdHotImin In cloud.
12 44 38	100ft		N	C	71	30	NadirLongRun3min Below cloud Passing 'RunB min'
12 50 18	"	240x1	Z	O	70	31	Zenith.
12 52 23	"		N	C	71	31	NadirLongRun3min EoR 1257
13 02 22	3500ft		CH	C	71	31	ColdHotImin In cloud
13 08 15	"		CH	C	71	31	— " — — " —
13 23 36	4900ft		Z	O	71	31	ZenithLongRun3min EoR 1328
13 30 37	"		Z	O	71	31	— " — Ci above? EoR 1335
1336	↓						↓ 3200ft
13 38 00	3200ft		CH	C	71	31	ColdHotImin In cloud
13 55 00	"		CH	C	71	31	ColdHotImin In cloud
13 58 43	2200ft		NZ	O	71	31	Nad Zen LongRun 30sec 300ft below cloud base
14 26 40	100ft		N	C	71	31	NadirLongRun3min ↳ EoR 1424
14 36 33	100ft	120x1	Z	O	71	31	Zenith — shutter still closed at start.
14 37 40	"		N	C	71	31	NadirLongRun3min
14 45	100ft↑		CH	C	71	30	ColdHot1min
15 00 39	6000 ft		N	C	71	31	NadirLongRun3min 8/8 Sc below
15 03 07	"		Z	O	71	31	ZenithLongRun3min EoR 1508

ARIES flight log

Flight: B419 | page 2 of 2

Date: | Operator(s): | Res: | Gain A: B:

Loc./Notes:

Scans: either "[IGMs]X[co-adds]", or "[stop DRS time]" if in start/stop, or "[macro name]". View: mirror angle.

DRS time	Flt ptrn	Scans	View	Shtr	HBB	CBB	Comments
15 12 08	77		Z	O	71	31	ZenithLongRun3min Skimming cloud tops
15 21 55	↓		—	C	71	32	
15 41 40	3400ft		CH	C	71	30	ColdHotImin In cloud / below?
15 47 29	"		N	C	71	31	NadirLongRun3min In Cloud. Patchy, v.shallow EoR 1551
15 55 08	1000ft		NZ	O	71	31	NadZenLongRun30sec EoR 1605
16 09 10	4500ft		N	C	71	30	NadirLongRun3min
16 11 40	"		Z	O	71	31	ZenithLongRun3min "Buggy all cloud below us"
16 19 19	" ↓		CH	C	71	31	ColdHotImin

Wet Nephelometer Log

Flight No **B419**.. Date 12/11/2008.. Operator's name JB…… Page .1..... of .....

GMT	Run	Height	Sample flow	Dry neph RH	Wet neph RH	Temp ramp	T_{water}	Remarks
11:43	p2					45		chiller on, Pre heater on
11:48	r2	500	14.1	52	84	10		
11:53:51	p3							run to short to complete cycle, leave low RH for cloud
`12:01	r4	3000						run above cloud too short for cycle.
12:08			14	42	38	45		ready for 10 min 500ft ru
12;15	r5	500	14.7	45	69	15		
12:25	r6	3500	14.0	39	46			leave at low rh for 10 min cloud run
12:45	r7	100	14.3	45	45.9	45		
12:58	p9		14.0	44	84	12		go to low rh for cloud run past ron brown r8
13:18	r8		13.2	40	40	44		up to high rh for above cloud work.
13:29		4800						chiller off for profile to 10,000ft
13:30		4800						confusion! another run at same hight
13:39		3100	14.4	38	78	15		back down to low rh for cloud run. no more 10000ft?
14:01	r12	2100	14.3	45	44	45		
14:09	r12	2100	14.3	44	85	12		
14:15	r12	"	"	"	53	45		
14:26	r13	100	14.6	44	85	12		
14:43	r13	100	"	"	87	13		missed last log entry, rh to high
14:50	p13	5000						chiller off for 10000ft profle.
15:13	r15	3800	14.0	14.5	60	45		chiller on for run above cloud top

Wet Nephelometer Log

Flight No ..... Date ..... Operator's name: ……

GMT	Run	Height	Sample flow	Dry neph RH	Wet neph RH	Temp ramp	T_{water}	Remarks
15:33		4500	13.8	0	60	13		rh to low, clean above cloud and in cloud run next
15:55	r17	1000	14.4	43	48	45		
16:09	r18	4500	13.9	16.5	83	13		
16:20						44		goto high rh for sawtooths

B419_SWS_SHIMS_EventLog.txt

```
09:34:28.76  ---      -     -     -     -
09:34:28.76  ---      -     -     -     -  +++ SOFTWARE START/RESTART +++
09:34:28.76  ---      -     -     -     -  +++ hh:mm:ss.ff / Instr / Posn / Period /
tVIS/ tNIR / Comment +++
09:34:28.76  ---      -     -     -     -  +++ Flight no. B419
09:34:28.76  ---      -     -     -     -
09:34:34.13  SWS      -     -     -     -  Telescope motor initialised.
09:34:36.89  SWS    0.0     -     -     -  Telescope sent to -6.000
09:34:37.45  SWS   -6.0     -     -     -  Telescope stopped.
09:34:40.75  SWS      -   100     -     -  Sample period changed from 250ms to 100ms.
09:34:45.31  USH      -   100     -     -  Sample period changed from 250ms to 100ms.
09:34:49.43  SWS      -     -     -     -  Initialization: VIS OK NIR OK
09:34:49.98  LSH      -   100     -     -  Sample period changed from 250ms to 100ms.
09:34:50.80  USH      -     -     -     -  Initialization: VIS OK NIR OK
09:34:51.92  LSH      -     -     -     -  Initialization: VIS OK NIR OK
09:34:54.10  SWS      -     -     -     5  NIR int.time changed from 5ms to 5ms.
09:34:57.80  SWS      -     -    40     -  VIS int.time changed from 5ms to 40ms.
09:34:57.81  SWS      -     -     -    40  NIR int.time changed from 5ms to 40ms.
09:34:59.24  USH      -     -     -     5  NIR int.time changed from 5ms to 5ms.
09:35:01.67  USH      -     -    40     -  VIS int.time changed from 5ms to 40ms.
09:35:01.68  USH      -     -     -    40  NIR int.time changed from 5ms to 40ms.
09:35:04.08  LSH      -     -     -     5  NIR int.time changed from 5ms to 5ms.
09:35:07.54  LSH      -     -   200     -  VIS int.time changed from 5ms to 200ms.
09:35:07.55  LSH      -     -     -   200  NIR int.time changed from 5ms to 200ms.
09:35:10.16  USH      -     -   100     -  VIS int.time changed from 40ms to 100ms.
09:35:10.16  USH      -     -     -   100  NIR int.time changed from 40ms to 100ms.
09:35:13.44  SWS      -     -   100     -  VIS int.time changed from 40ms to 100ms.
09:35:13.44  SWS      -     -     -   100  NIR int.time changed from 40ms to 100ms.
09:35:14.62  SWS      -     -     -     -  Manual scene recording started.
09:35:14.62  LSH      -     -     -     -  Manual scene recording started.
09:35:14.63  USH      -     -     -     -  Manual scene recording started.
09:35:46.23  SWS      -     -     -     -  Idling
09:35:46.23  USH      -     -     -     -  Idling
09:35:46.26  LSH      -     -     -     -  Idling
09:35:48.23  SWS      -     -     -     -  Dark measurement started.
09:35:48.23  LSH      -     -     -     -  Dark measurement started.
09:35:48.24  USH      -     -     -     -  Dark measurement started.
09:35:49.66  SWS      -     -     -     -  Idling
09:35:50.09  USH      -     -     -     -  Idling
09:35:50.89  LSH      -     -     -     -  Idling
09:35:57.94  SWS   -6.0     -     -     -  Telescope sent to 174.000
09:35:59.60  SWS  169.8     -     -     -  Telescope stopped.
09:46:17.51  LSH      -     -     -     -  Manual scene recording started.
09:46:17.51  USH      -     -     -     -  Manual scene recording started.
09:46:17.53  SWS      -     -     -     -  Manual scene recording started.
09:46:21.20  USH      -     -     -     -  Dark measurement started.
09:46:21.25  LSH      -     -     -     -  Dark measurement started.
09:46:21.28  SWS      -     -     -     -  Dark measurement started.
09:46:21.83  LSH      -     -     -     -  Warning: Abnormally bright dark measurement.
09:46:22.64  USH      -     -     -     -  Manual scene recording started.
09:46:23.04  SWS      -     -     -     -  Manual scene recording started.
09:46:23.86  LSH      -     -     -     -  Manual scene recording started.
09:46:26.96  ---      -     -     -     -  Reset shutters.
09:46:32.33  USH      -     -     -     -  Idling
09:46:32.34  SWS      -     -     -     -  Idling
09:46:32.36  LSH      -     -     -     -  Idling
09:46:35.87  ---      -     -     -     -  Reset shutters.
09:47:25.39  ---      -     -     -     -  *** 19 deg
09:47:29.87  USH      -     -     -     -  Dark measurement started.
09:47:29.87  LSH      -     -     -     -  Dark measurement started.
09:47:29.89  SWS      -     -     -     -  Dark measurement started.
09:47:30.50  LSH      -     -     -     -  Warning: Abnormally bright dark measurement.
09:47:31.31  USH      -     -     -     -  Idling
09:47:31.71  SWS      -     -     -     -  Idling
09:47:32.52  LSH      -     -     -     -  Idling
09:47:37.91  ---      -     -     -     -  Reset shutters.
09:47:41.12  ---      -     -     -     -  Reset shutters.
```

10:21:15.82	SWS	174.0	-	-	-	Telescope sent to -6.000
10:21:17.51	SWS	-5.7	-	-	-	Telescope stopped.
10:21:21.58	SWS	-	-	-	-	Manual scene recording started.
10:21:21.58	LSH	-	-	-	-	Manual scene recording started.
10:21:21.62	USH	-	-	-	-	Manual scene recording started.
10:21:25.62	---	-	-	-	-	Reset shutters.
10:21:32.62	SWS	-	-	-	-	Dark measurement started.
10:21:32.68	USH	-	-	-	-	Dark measurement started.
10:21:33.48	LSH	-	-	-	-	Dark measurement started.
10:21:33.92	LSH	-	-	-	-	Warning: Abnormally bright dark measurement.
10:21:34.77	SWS	-	-	-	-	Manual scene recording started.
10:21:34.80	USH	-	-	-	-	Manual scene recording started.
10:21:36.08	LSH	-	-	-	-	Manual scene recording started.
10:21:36.45	SWS	-	-	-	-	Dark measurement started.
10:21:36.50	USH	-	-	-	-	Dark measurement started.
10:21:36.58	LSH	-	-	-	-	Dark measurement started.
10:21:38.49	SWS	-	-	-	-	Manual scene recording started.
10:21:38.71	USH	-	-	-	-	Manual scene recording started.
10:21:39.82	LSH	-	-	-	-	Manual scene recording started.
10:21:42.96	USH	-	-	-	-	Dark measurement started.
10:21:43.01	SWS	-	-	-	-	Dark measurement started.
10:21:43.11	LSH	-	-	-	-	Dark measurement started.
10:21:43.53	SWS	-	-	-	-	Warning: Abnormally bright dark measurement.
10:21:43.54	SWS	-	-	-	-	Dark measurement started.
10:21:43.84	LSH	-	-	-	-	Warning: Abnormally bright dark measurement.
10:21:44.57	USH	-	-	-	-	Manual scene recording started.
10:21:45.19	SWS	-	-	-	-	Idling
10:21:46.02	LSH	-	-	-	-	Manual scene recording started.
10:21:47.87	SWS	-	-	-	-	Manual scene recording started.
10:21:50.15	USH	-	-	-	-	Idling
10:21:50.22	SWS	-	-	-	-	Idling
10:21:50.26	LSH	-	-	-	-	Idling
10:49:25.50	USH	-	-	-	-	Manual scene recording started.
10:49:25.50	LSH	-	-	-	-	Manual scene recording started.
10:49:25.51	SWS	-	-	-	-	Manual scene recording started.
10:49:30.71	---	-	-	-	-	Reset shutters.
10:49:35.83	LSH	-	-	-	-	Dark measurement started.
10:49:35.86	USH	-	-	-	-	Dark measurement started.
10:49:35.89	SWS	-	-	-	-	Dark measurement started.
10:49:37.48	USH	-	-	-	-	Manual scene recording started.
10:49:37.73	SWS	-	-	-	-	Manual scene recording started.
10:49:38.31	LSH	-	-	-	-	Manual scene recording started.
10:49:41.94	SWS	-	-	40	-	VIS int.time changed from 100ms to 40ms.
10:49:41.95	SWS	-	-	-	40	NIR int.time changed from 100ms to 40ms.
10:49:45.32	USH	-	-	40	-	VIS int.time changed from 100ms to 40ms.
10:49:45.33	USH	-	-	-	40	NIR int.time changed from 100ms to 40ms.
10:49:47.30	USH	-	-	-	-	Dark measurement started.
10:49:47.31	SWS	-	-	-	-	Dark measurement started.
10:49:47.38	LSH	-	-	-	-	Dark measurement started.
10:49:48.18	USH	-	-	-	-	Manual scene recording started.
10:49:48.37	SWS	-	-	-	-	Manual scene recording started.
10:49:50.22	LSH	-	-	-	-	Manual scene recording started.
10:49:51.16	USH	-	-	-	-	Dark measurement started.
10:49:51.23	SWS	-	-	-	-	Dark measurement started.
10:49:51.34	LSH	-	-	-	-	Dark measurement started.
10:49:52.11	USH	-	-	-	-	Manual scene recording started.
10:49:52.25	SWS	-	-	-	-	Manual scene recording started.
10:49:54.01	LSH	-	-	-	-	Manual scene recording started.
10:55:44.76	LSH	-	-	-	-	Dark measurement started.
10:55:44.81	SWS	-	-	-	-	Dark measurement started.
10:55:44.84	USH	-	-	-	-	Dark measurement started.
10:55:45.80	SWS	-	-	-	-	Manual scene recording started.
10:55:46.02	USH	-	-	-	-	Manual scene recording started.
10:55:47.24	LSH	-	-	-	-	Manual scene recording started.
10:55:51.00	USH	-	-	-	-	Dark measurement started.
10:55:51.02	LSH	-	-	-	-	Dark measurement started.
10:55:51.10	SWS	-	-	-	-	Dark measurement started.
10:55:51.67	SWS	-	-	-	-	Dark measurement started.
10:55:51.85	USH	-	-	-	-	Manual scene recording started.

```
10:55:52.51  SWS      -     -     -     -  Idling
10:55:53.68  LSH      -     -     -     -  Manual scene recording started.
10:55:56.12  LSH      -     -     -     -  Idling
10:55:56.17  USH      -     -     -     -  Idling
10:57:24.80  ---      -     -     -     -
10:57:24.80  ---      -     -     -     -  +++ SOFTWARE START/RESTART +++
10:57:24.80  ---      -     -     -     -  +++ hh:mm:ss.ff / Instr / Posn / Period /
tVIS/ tNIR / Comment +++
10:57:24.80  ---      -     -     -     -  +++ Flight no. B419
10:57:24.80  ---      -     -     -     -
10:57:29.24  SWS      -     -     -     -  Telescope motor initialised.
10:57:32.43  SWS    0.0     -     -     -  Telescope sent to -6.000
10:57:36.65  SWS      -   100     -     -  Sample period changed from 250ms to 100ms.
10:57:40.02  USH      -   100     -     -  Sample period changed from 250ms to 100ms.
10:57:44.77  SWS      -     -     -     -  Initialization: VIS OK NIR OK
10:57:45.64  LSH      -   100     -     -  Sample period changed from 250ms to 100ms.
10:57:46.17  USH      -     -     -     -  Initialization: VIS OK NIR OK
10:57:46.94  LSH      -     -     -     -  Initialization: VIS OK NIR OK
10:57:48.81  SWS      -     -     -     5  NIR int.time changed from 5ms to 5ms.
10:57:51.47  SWS      -     -    40     -  VIS int.time changed from 5ms to 40ms.
10:57:51.48  SWS      -     -     -    40  NIR int.time changed from 5ms to 40ms.
10:57:52.54  SWS      -     -     -     -  Manual scene recording started.
10:57:54.86  USH      -     -     -     5  NIR int.time changed from 5ms to 5ms.
10:57:57.22  USH      -     -    40     -  VIS int.time changed from 5ms to 40ms.
10:57:57.23  USH      -     -     -    40  NIR int.time changed from 5ms to 40ms.
10:57:58.39  USH      -     -     -     -  Dark measurement started.
10:57:58.92  USH      -     -     -     -  Warning: Abnormally bright dark measurement.
10:57:59.50  USH      -     -     -     -  Idling
10:58:02.17  USH      -     -     -     -  Manual scene recording started.
10:58:07.29  LSH      -     -     -     5  NIR int.time changed from 5ms to 5ms.
10:58:10.06  LSH      -     -   100     -  VIS int.time changed from 5ms to 100ms.
10:58:10.07  LSH      -     -     -   100  NIR int.time changed from 5ms to 100ms.
10:58:15.03  LSH      -     -     -     -  Manual scene recording started.
10:58:42.44  ---      -     -     -     -  Reset shutters.
10:58:47.09  ---      -     -     -     -  Reset shutters.
10:58:51.57  USH      -     -     -     -  Dark measurement started.
10:58:51.62  SWS      -     -     -     -  Dark measurement started.
10:58:51.64  LSH      -     -     -     -  Dark measurement started.
10:58:52.51  USH      -     -     -     -  Manual scene recording started.
10:58:52.65  SWS      -     -     -     -  Manual scene recording started.
10:58:53.43  LSH      -     -     -     -  Manual scene recording started.
10:58:55.29  USH      -     -     -     -  Dark measurement started.
10:58:55.33  LSH      -     -     -     -  Dark measurement started.
10:58:55.36  SWS      -     -     -     -  Dark measurement started.
10:58:56.13  USH      -     -     -     -  Manual scene recording started.
10:58:56.57  SWS      -     -     -     -  Manual scene recording started.
10:58:56.93  LSH      -     -     -     -  Manual scene recording started.
10:59:07.73  SWS   -6.0     -     -     -  Telescope sent to 90.000
10:59:08.84  SWS   90.0     -     -     -  Telescope stopped.
11:26:01.20  SWS      -     -     -     -  Warning: Clipping may be occurring.
11:29:14.19  SWS      -     -     -     -  Warning: Clipping may be occurring.
11:34:00.15  SWS   90.0     -     -     -  Telescope sent to -6.000
11:34:01.29  SWS   -6.0     -     -     -  Telescope stopped.
11:34:02.84  LSH      -     -     -     -  Dark measurement started.
11:34:02.90  SWS      -     -     -     -  Dark measurement started.
11:34:02.93  USH      -     -     -     -  Dark measurement started.
11:34:03.36  SWS      -     -     -     -  Warning: Abnormally bright dark measurement.
11:34:03.42  SWS      -     -     -     -  Warning: Abnormally bright dark measurement.
11:34:03.51  USH      -     -     -     -  Warning: Abnormally bright dark measurement.
11:34:03.94  SWS      -     -     -     -  Manual scene recording started.
11:34:04.11  USH      -     -     -     -  Manual scene recording started.
11:34:04.27  LSH      -     -     -     -  Manual scene recording started.
11:34:06.60  ---      -     -     -     -  Reset shutters.
11:34:11.73  SWS      -     -     -     -  Dark measurement started.
11:34:11.77  LSH      -     -     -     -  Dark measurement started.
11:34:11.80  USH      -     -     -     -  Dark measurement started.
11:34:12.62  SWS      -     -     -     -  Manual scene recording started.
11:34:12.99  USH      -     -     -     -  Manual scene recording started.
11:34:13.40  LSH      -     -     -     -  Manual scene recording started.
```

```
11:37:48.40  LSH      -     -     -     -  Dark measurement started.
11:37:48.46  SWS      -     -     -     -  Dark measurement started.
11:37:48.46  USH      -     -     -     -  Dark measurement started.
11:37:49.51  SWS      -     -     -     -  Manual scene recording started.
11:37:49.72  USH      -     -     -     -  Manual scene recording started.
11:37:49.88  LSH      -     -     -     -  Manual scene recording started.
11:37:53.79  SWS   -6.0     -     -     -  Telescope sent to 174.000
11:37:54.67  SWS      -     -     -     -  Warning: Clipping may be occurring.
11:37:55.44  SWS  170.9     -     -     -  Telescope stopped.
11:37:58.75  ---      -     -     -     -  Reset shutters.
11:38:02.89  USH      -     -     -     -  Dark measurement started.
11:38:02.95  SWS      -     -     -     -  Dark measurement started.
11:38:02.97  LSH      -     -     -     -  Dark measurement started.
11:38:03.78  USH      -     -     -     -  Manual scene recording started.
11:38:04.06  SWS      -     -     -     -  Manual scene recording started.
11:38:04.43  SWS      -     -     -     -  Manual scene recording started.
11:38:04.74  LSH      -     -     -     -  Manual scene recording started.
11:38:09.37  ---      -     -     -     -  *** run 1
11:40:09.26  ---      -     -     -     -  *** profile descent
11:40:22.13  ---      -     -     -     -  *** 18 deg
11:40:57.41  ---      -     -     -     -  *** 19 deg
11:43:01.02  ---      -     -     -     -  *** in cloud
11:43:40.12  ---      -     -     -     -  *** leaving cloud (CT were 3500 ft)
11:43:46.53  ---      -     -     -     -  *** cloud base 2700 ft
11:43:59.10  ---      -     -     -     -  *** 18 deg
11:46:29.37  ---      -     -     -     -  *** run 2 at 500 ft
11:46:35.07  ---      -     -     -     -  *** below cloud run
11:46:39.05  SWS  174.0     -     -     -  Telescope sent to -6.000
11:46:40.73  SWS   -3.8     -     -     -  Telescope stopped.
11:46:42.75  SWS      -     -     -     -  Dark measurement started.
11:46:42.77  LSH      -     -     -     -  Dark measurement started.
11:46:42.85  USH      -     -     -     -  Dark measurement started.
11:46:43.60  SWS      -     -     -     -  Manual scene recording started.
11:46:44.04  USH      -     -     -     -  Manual scene recording started.
11:46:44.41  LSH      -     -     -     -  Manual scene recording started.
11:46:47.11  USH      -     -     -     -  Dark measurement started.
11:46:47.14  LSH      -     -     -     -  Dark measurement started.
11:46:47.22  SWS      -     -     -     -  Dark measurement started.
11:46:47.96  USH      -     -     -     -  Manual scene recording started.
11:46:48.38  SWS      -     -     -     -  Manual scene recording started.
11:46:48.77  LSH      -     -     -     -  Manual scene recording started.
11:48:31.02  ---      -     -     -     -  *** 18 deg
11:51:31.02  ---      -     -     -     -  *** end of run
11:51:36.07  ---      -     -     -     -  *** profile climb
11:52:29.67  ---      -     -     -     -  *** 17 deg
11:54:58.19  ---      -     -     -     -  *** run 3 at 3300 ft in cloud run
11:57:48.42  ---      -     -     -     -  *** 16 deg
11:59:48.45  ---      -     -     -     -  *** 15 deg
12:00:03.88  ---      -     -     -     -  *** end of run
12:00:12.87  ---      -     -     -     -  *** profile climb to above cloud
12:00:46.24  ---      -     -     -     -  *** above cloud
12:00:49.40  LSH      -     -     -     -  Dark measurement started.
12:00:49.41  SWS      -     -     -     -  Dark measurement started.
12:00:49.43  USH      -     -     -     -  Dark measurement started.
12:00:49.89  SWS      -     -     -     -  Dark measurement started.
12:00:50.09  USH      -     -     -     -  Dark measurement started.
12:00:50.89  SWS      -     -     -     -  Idling
12:00:50.94  LSH      -     -     -     -  Manual scene recording started.
12:00:51.08  USH      -     -     -     -  Idling
12:00:53.29  SWS      -     -     -     -  Manual scene recording started.
12:00:53.30  USH      -     -     -     -  Manual scene recording started.
12:00:55.20  USH      -     -     -     -  Dark measurement started.
12:00:55.28  LSH      -     -     -     -  Dark measurement started.
12:00:55.29  SWS      -     -     -     -  Dark measurement started.
12:00:55.88  SWS      -     -     -     -  Dark measurement started.
12:00:56.08  USH      -     -     -     -  Manual scene recording started.
12:00:56.79  SWS      -     -     -     -  Idling
12:00:56.90  LSH      -     -     -     -  Manual scene recording started.
12:00:58.71  SWS      -     -     -     -  Manual scene recording started.
```

```
12:01:18.96  ---      -     -     -     -  *** 5 min above cloud run
12:01:30.69  ---      -     -     -     -  *** start of run at 4600 ft
12:02:08.69  ---      -     -     -     -  *** 16 deg
12:04:11.15  ---      -     -     -     -  *** 15 deg
12:06:36.67  ---      -     -     -     -  *** end of run
12:06:47.55  ---      -     -     -     -  *** profile descent to 50 ft
12:07:29.31  ---      -     -     -     -  *** clouf top 3800 ft
12:07:54.85  ---      -     -     -     -  *** 14 deg
12:08:13.94  ---      -     -     -     -  *** cloud base 3100 ft
12:11:40.15  ---      -     -     -     -  *** run at 500 ft
12:11:58.48  ---      -     -     -     -  *** run 5
12:12:45.44  ---      -     -     -     -  *** 13 deg
12:13:10.53  ---      -     -     -     -  *** 14 deg
12:13:33.88  SWS      -     -     -     -  Dark measurement started.
12:13:33.90  USH      -     -     -     -  Dark measurement started.
12:13:33.95  LSH      -     -     -     -  Dark measurement started.
12:13:34.78  SWS      -     -     -     -  Manual scene recording started.
12:13:35.00  USH      -     -     -     -  Manual scene recording started.
12:13:35.73  LSH      -     -     -     -  Manual scene recording started.
12:15:44.57  ---      -     -     -     -  *** 15 deg
12:16:29.41  LSH      -     -     -     -  Dark measurement started.
12:16:29.44  SWS      -     -     -     -  Dark measurement started.
12:16:29.46  USH      -     -     -     -  Dark measurement started.
12:16:30.47  SWS      -     -     -     -  Manual scene recording started.
12:16:30.75  USH      -     -     -     -  Manual scene recording started.
12:16:30.90  LSH      -     -     -     -  Manual scene recording started.
12:16:33.58  LSH      -     -     -     -  Dark measurement started.
12:16:33.62  USH      -     -     -     -  Dark measurement started.
12:16:33.64  SWS      -     -     -     -  Dark measurement started.
12:16:34.68  USH      -     -     -     -  Manual scene recording started.
12:16:34.90  SWS      -     -     -     -  Manual scene recording started.
12:16:35.10  LSH      -     -     -     -  Manual scene recording started.
12:19:49.05  SWS      -     -     -     -  Dark measurement started.
12:19:49.06  LSH      -     -     -     -  Dark measurement started.
12:19:49.11  USH      -     -     -     -  Dark measurement started.
12:19:49.91  SWS      -     -     -     -  Manual scene recording started.
12:19:50.46  USH      -     -     -     -  Manual scene recording started.
12:19:50.74  LSH      -     -     -     -  Manual scene recording started.
12:19:50.80  USH      -     -     -     -  Manual scene recording started.
12:22:18.42  ---      -     -     -     -  *** end of run
12:22:27.03  ---      -     -     -     -  *** profile climb to 3500 ft
12:22:43.36  ---      -     -     -     -  *** 16 deg
12:25:05.14  ---      -     -     -     -  *** cloud base 2900 ft
12:25:42.63  ---      -     -     -     -  *** run at 3500ft
12:25:49.81  ---      -     -     -     -  *** in cloud run
12:28:15.30  SWS      -     -     -     -  Dark measurement started.
12:28:15.33  LSH      -     -     -     -  Dark measurement started.
12:28:15.39  USH      -     -     -     -  Dark measurement started.
12:28:16.15  SWS      -     -     -     -  Manual scene recording started.
12:28:16.61  USH      -     -     -     -  Manual scene recording started.
12:28:17.01  LSH      -     -     -     -  Manual scene recording started.
12:28:19.66  SWS   -6.0     -     -     -  Telescope sent to 174.000
12:28:21.30  SWS  171.6     -     -     -  Telescope stopped.
12:28:24.43  SWS      -     -     -     -  Dark measurement started.
12:28:24.43  USH      -     -     -     -  Dark measurement started.
12:28:24.50  LSH      -     -     -     -  Dark measurement started.
12:28:25.30  SWS      -     -     -     -  Manual scene recording started.
12:28:25.57  USH      -     -     -     -  Manual scene recording started.
12:28:26.37  LSH      -     -     -     -  Manual scene recording started.
12:29:08.86  ---      -     -     -     -  *** 16 deg
12:30:57.69  SWS  174.0     -     -     -  Telescope sent to -6.000
12:30:59.39  SWS   -4.4     -     -     -  Telescope stopped.
12:31:03.15  SWS      -     -     -     -  Dark measurement started.
12:31:03.21  USH      -     -     -     -  Dark measurement started.
12:31:03.23  LSH      -     -     -     -  Dark measurement started.
12:31:04.05  SWS      -     -     -     -  Manual scene recording started.
12:31:04.21  USH      -     -     -     -  Manual scene recording started.
12:31:05.01  LSH      -     -     -     -  Manual scene recording started.
12:35:16.32  ---      -     -     -     -  *** end of run
```

```
12:36:06.88  ---      -     -     -     -  *** correctio end of run now
12:36:14.35  ---      -     -     -     -  *** profile climb
12:36:46.26  ---      -     -     -     -  *** cloud top 4100 ft
12:37:05.12  USH      -     -     -     -  Idling
12:37:05.17  SWS      -     -     -     -  Idling
12:37:05.21  LSH      -     -     -     -  Idling
12:37:06.93  SWS   -6.0     -     -     -  Telescope sent to 174.000
12:37:08.67  SWS  173.9     -     -     -  Telescope stopped.
12:37:09.53  SWS      -     -     -     -  Manual scene recording started.
12:37:09.53  LSH      -     -     -     -  Manual scene recording started.
12:37:09.54  USH      -     -     -     -  Manual scene recording started.
12:37:17.18  USH      -     -     -     -  Dark measurement started.
12:37:17.25  LSH      -     -     -     -  Dark measurement started.
12:37:17.28  SWS      -     -     -     -  Dark measurement started.
12:37:17.85  SWS      -     -     -     -  Dark measurement started.
12:37:18.07  USH      -     -     -     -  Manual scene recording started.
12:37:18.73  SWS      -     -     -     -  Idling
12:37:18.84  LSH      -     -     -     -  Manual scene recording started.
12:37:20.05  SWS      -     -     -     -  Manual scene recording started.
12:37:48.17  ---      -     -     -     -  *** reverse at 5100 ft
12:37:54.88  ---      -     -     -     -  *** profile down to 50 ft
12:38:04.27  ---      -     -     -     -  *** profile 8
12:38:19.30  ---      -     -     -     -  *** 15 deg
12:38:59.17  ---      -     -     -     -  *** cloud top 4000 ft
12:41:24.77  ---      -     -     -     -  *** cloud base 2500 ft
12:41:54.70  ---      -     -     -     -  *** 14 deg
12:43:18.91  ---      -     -     -     -  *** at 50 ft will move sws telescope to zenith
12:43:35.32  ---      -     -     -     -  *** 15 deg
12:44:32.41  SWS  174.0     -     -     -  Telescope sent to -6.000
12:44:34.13  SWS   -5.0     -     -     -  Telescope stopped.
12:44:43.80  ---      -     -     -     -  *** run at 100 ft
12:46:52.64  ---      -     -     -     -  *** 16 deg
12:52:01.23  USH      -     -     -     -  Dark measurement started.
12:52:01.25  LSH      -     -     -     -  Dark measurement started.
12:52:01.29  SWS      -     -     -     -  Dark measurement started.
12:52:02.14  USH      -     -     -     -  Manual scene recording started.
12:52:02.59  SWS      -     -     -     -  Manual scene recording started.
12:52:03.02  LSH      -     -     -     -  Manual scene recording started.
12:52:05.00  SWS      -     -     -     -  Dark measurement started.
12:52:05.02  LSH      -     -     -     -  Dark measurement started.
12:52:05.05  USH      -     -     -     -  Dark measurement started.
12:52:05.87  SWS      -     -     -     -  Manual scene recording started.
12:52:06.25  USH      -     -     -     -  Manual scene recording started.
12:52:06.66  LSH      -     -     -     -  Manual scene recording started.
12:53:18.21  ---      -     -     -     -  *** 17 deg
12:57:19.80  ---      -     -     -     -  *** end of run
12:57:27.89  ---      -     -     -     -  *** profile climb
12:57:38.40  ---      -     -     -     -  *** p9
13:00:20.78  ---      -     -     -     -  *** in cloud
13:00:55.98  ---      -     -     -     -  *** end of p
13:02:25.06  ---      -     -     -     -  *** syart of run
13:02:35.60  ---      -     -     -     -  *** run 8
13:03:02.52  LSH      -     -     -     -  Dark measurement started.
13:03:02.64  SWS      -     -     -     -  Dark measurement started.
13:03:02.65  USH      -     -     -     -  Dark measurement started.
13:03:03.60  SWS      -     -     -     -  Manual scene recording started.
13:03:03.81  USH      -     -     -     -  Manual scene recording started.
13:03:04.02  LSH      -     -     -     -  Manual scene recording started.
13:03:06.80  USH      -     -     -     -  Dark measurement started.
13:03:06.87  LSH      -     -     -     -  Dark measurement started.
13:03:06.92  SWS      -     -     -     -  Dark measurement started.
13:03:07.69  USH      -     -     -     -  Manual scene recording started.
13:03:08.06  SWS      -     -     -     -  Manual scene recording started.
13:03:08.49  LSH      -     -     -     -  Manual scene recording started.
13:03:17.60  SWS   -6.0     -     -     -  Telescope sent to 174.000
13:03:19.31  SWS  173.2     -     -     -  Telescope stopped.
13:03:36.60  SWS  174.0     -     -     -  Telescope sent to 174.000
13:03:43.73  ---      -     -     -     -  *** 18 deg
13:11:43.20  LSH      -     -     -     -  Dark measurement started.
```

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13:11:43.22  USH      -     -     -     -  Dark measurement started.
13:11:43.25  SWS      -     -     -     -  Dark measurement started.
13:11:43.86  SWS      -     -     -     -  Dark measurement started.
13:11:44.24  USH      -     -     -     -  Manual scene recording started.
13:11:44.67  LSH      -     -     -     -  Manual scene recording started.
13:11:44.77  SWS      -     -     -     -  Idling
13:11:47.66  SWS      -     -     -     -  Manual scene recording started.
13:11:50.01  SWS      -     -     -     -  Dark measurement started.
13:11:50.02  LSH      -     -     -     -  Dark measurement started.
13:11:50.03  USH      -     -     -     -  Dark measurement started.
13:11:50.90  SWS      -     -     -     -  Manual scene recording started.
13:11:51.27  USH      -     -     -     -  Manual scene recording started.
13:11:51.69  LSH      -     -     -     -  Manual scene recording started.
13:12:11.13  ---      -     -     -     -  *** rb
13:12:33.72  ---      -     -     -     -  *** point at which we were over the top of the
ron brown
13:15:53.15  LSH      -     -     -     -  Dark measurement started.
13:15:53.16  USH      -     -     -     -  Dark measurement started.
13:15:53.27  SWS      -     -     -     -  Dark measurement started.
13:15:54.20  USH      -     -     -     -  Manual scene recording started.
13:15:54.42  SWS      -     -     -     -  Manual scene recording started.
13:15:54.65  LSH      -     -     -     -  Manual scene recording started.
13:16:45.64  ---      -     -     -     -  *** 19 deg
13:21:07.65  ---      -     -     -     -  *** 18 deg
13:22:01.57  ---      -     -     -     -  *** end of run
13:22:25.45  ---      -     -     -     -  *** profile climb to 1000 ft above cloud, p10
13:22:38.14  ---      -     -     -     -  *** cloud top 3900 ft
13:23:06.15  USH      -     -     -     -  Dark measurement started.
13:23:06.18  LSH      -     -     -     -  Dark measurement started.
13:23:06.21  SWS      -     -     -     -  Dark measurement started.
13:23:07.05  USH      -     -     -     -  Manual scene recording started.
13:23:07.42  SWS      -     -     -     -  Manual scene recording started.
13:23:07.84  LSH      -     -     -     -  Manual scene recording started.
13:23:13.50  SWS      -     -    30     -  VIS int.time changed from 40ms to 30ms.
13:23:13.52  SWS      -     -     -    30  NIR int.time changed from 40ms to 30ms.
13:23:16.58  LSH      -     -     -     -  Dark measurement started.
13:23:16.59  SWS      -     -     -     -  Dark measurement started.
13:23:16.61  USH      -     -     -     -  Dark measurement started.
13:23:17.35  SWS      -     -     -     -  Manual scene recording started.
13:23:17.89  USH      -     -     -     -  Manual scene recording started.
13:23:18.32  LSH      -     -     -     -  Manual scene recording started.
13:23:20.03  LSH      -     -     -     -  Dark measurement started.
13:23:20.09  USH      -     -     -     -  Dark measurement started.
13:23:20.13  SWS      -     -     -     -  Dark measurement started.
13:23:21.10  USH      -     -     -     -  Manual scene recording started.
13:23:21.20  SWS      -     -     -     -  Manual scene recording started.
13:23:21.53  LSH      -     -     -     -  Manual scene recording started.
13:23:50.37  ---      -     -     -     -  *** run at 4900 ft
13:25:30.20  ---      -     -     -     -  *** 17 deg
13:30:52.43  ---      -     -     -     -  *** 16 deg
13:31:37.43  LSH      -     -     -     -  Dark measurement started.
13:31:37.45  USH      -     -     -     -  Dark measurement started.
13:31:37.48  SWS      -     -     -     -  Dark measurement started.
13:31:38.48  USH      -     -     -     -  Manual scene recording started.
13:31:38.61  SWS      -     -     -     -  Manual scene recording started.
13:31:38.92  LSH      -     -     -     -  Manual scene recording started.
13:33:31.53  ---      -     -     -     -  *** 15 deg
13:35:28.28  ---      -     -     -     -  *** end of run at 4800 ft
13:36:34.28  ---      -     -     -     -  *** cloud top 3900 ft
13:38:02.44  ---      -     -     -     -  *** in cloud run 3200 ft
13:38:14.30  ---      -     -     -     -  *** run 11
13:41:55.86  ---      -     -     -     -  *** 16 deg
13:45:28.10  LSH      -     -     -     -  Dark measurement started.
13:45:28.14  SWS      -     -     -     -  Dark measurement started.
13:45:28.16  USH      -     -     -     -  Dark measurement started.
13:45:29.07  SWS      -     -     -     -  Manual scene recording started.
13:45:29.35  USH      -     -     -     -  Manual scene recording started.
13:45:29.61  LSH      -     -     -     -  Manual scene recording started.
13:45:39.01  SWS  174.0     -     -     -  Telescope sent to -6.000
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13:45:40.77  SWS   -5.9     -     -     -  Telescope stopped.
13:45:42.83  SWS      -     -     -     -  Dark measurement started.
13:45:42.86  LSH      -     -     -     -  Dark measurement started.
13:45:42.92  USH      -     -     -     -  Dark measurement started.
13:45:43.66  SWS      -     -     -     -  Manual scene recording started.
13:45:44.21  USH      -     -     -     -  Manual scene recording started.
13:45:44.50  LSH      -     -     -     -  Manual scene recording started.
13:46:46.03  ---      -     -     -     -  *** 16 deg
13:47:26.82  ---      -     -     -     -  *** over ron brown now
13:53:18.30  ---      -     -     -     -  *** 17 deg
13:54:28.76  ---      -     -     -     -  *** 16 deg
13:56:56.98  ---      -     -     -     -  *** end of run
13:57:32.83  ---      -     -     -     -  *** profile descent
13:57:59.79  ---      -     -     -     -  *** 15 deg
13:58:21.58  ---      -     -     -     -  *** cloud base 2500 ft
13:58:42.76  ---      -     -     -     -  *** end of p
13:58:48.99  ---      -     -     -     -  *** at 2200 ft
13:59:40.96  SWS      -     -     -     -  Dark measurement started.
13:59:40.99  LSH      -     -     -     -  Dark measurement started.
13:59:41.03  USH      -     -     -     -  Dark measurement started.
13:59:41.67  USH      -     -     -     -  Dark measurement started.
13:59:41.76  SWS      -     -     -     -  Manual scene recording started.
13:59:42.54  USH      -     -     -     -  Idling
13:59:42.66  LSH      -     -     -     -  Manual scene recording started.
13:59:44.49  USH      -     -     -     -  Manual scene recording started.
13:59:47.19  USH      -     -     -     -  Dark measurement started.
13:59:47.23  LSH      -     -     -     -  Dark measurement started.
13:59:47.25  SWS      -     -     -     -  Dark measurement started.
13:59:47.73  LSH      -     -     -     -  Dark measurement started.
13:59:47.86  SWS      -     -     -     -  Dark measurement started.
13:59:48.04  USH      -     -     -     -  Manual scene recording started.
13:59:48.76  SWS      -     -     -     -  Idling
13:59:49.25  LSH      -     -     -     -  Idling
13:59:51.93  SWS   -6.0     -     -     -  Telescope sent to 174.000
13:59:53.66  SWS  173.6     -     -     -  Telescope stopped.
13:59:54.42  SWS      -     -     -     -  Manual scene recording started.
13:59:54.42  LSH      -     -     -     -  Manual scene recording started.
13:59:59.68  SWS      -     -     -     -  Dark measurement started.
13:59:59.70  USH      -     -     -     -  Dark measurement started.
13:59:59.76  LSH      -     -     -     -  Dark measurement started.
14:00:00.44  SWS      -     -     -     -  Manual scene recording started.
14:00:00.75  USH      -     -     -     -  Manual scene recording started.
14:00:01.54  LSH      -     -     -     -  Manual scene recording started.
14:00:29.50  ---      -     -     -     -  *** 15 deg
14:01:13.86  ---      -     -     -     -  *** start run
14:01:19.66  ---      -     -     -     -  *** 300 ft below cloud
14:01:23.29  USH      -     -     -     -  Dark measurement started.
14:01:23.35  SWS      -     -     -     -  Dark measurement started.
14:01:23.36  LSH      -     -     -     -  Dark measurement started.
14:01:24.22  USH      -     -     -     -  Manual scene recording started.
14:01:24.38  SWS      -     -     -     -  Manual scene recording started.
14:01:25.26  LSH      -     -     -     -  Manual scene recording started.
14:01:31.52  USH      -     -     -     -  Idling
14:01:31.53  SWS      -     -     -     -  Idling
14:01:31.60  LSH      -     -     -     -  Idling
14:01:33.40  SWS  174.0     -     -     -  Telescope sent to -6.000
14:01:35.15  SWS   -5.9     -     -     -  Telescope stopped.
14:01:36.06  USH      -     -     -     -  Manual scene recording started.
14:01:36.07  LSH      -     -     -     -  Manual scene recording started.
14:01:36.07  SWS      -     -     -     -  Manual scene recording started.
14:01:38.85  LSH      -     -     -     -  Dark measurement started.
14:01:38.88  USH      -     -     -     -  Dark measurement started.
14:01:38.92  SWS      -     -     -     -  Dark measurement started.
14:01:39.51  SWS      -     -     -     -  Dark measurement started.
14:01:39.93  USH      -     -     -     -  Manual scene recording started.
14:01:40.29  SWS      -     -     -     -  Idling
14:01:40.33  LSH      -     -     -     -  Manual scene recording started.
14:01:41.91  SWS      -     -     -     -  Manual scene recording started.
14:01:46.78  ---      -     -     -     -  *** run 12
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14:03:42.65  ---      -     -     -     -  *** 14 deg
14:08:20.92  ---      -     -     -     -  *** 13 deg
14:09:38.30  ---      -     -     -     -  *** 14 deg
14:11:33.02  ---      -     -     -     -  *** over flying ron brown now
14:11:37.20  ---      -     -     -     -  *** 15 deg
14:12:11.75  LSH      -     -     -     -  Dark measurement started.
14:12:11.79  USH      -     -     -     -  Dark measurement started.
14:12:11.85  SWS      -     -     -     -  Dark measurement started.
14:12:12.89  USH      -     -     -     -  Manual scene recording started.
14:12:12.99  SWS      -     -     -     -  Manual scene recording started.
14:12:13.29  LSH      -     -     -     -  Manual scene recording started.
14:12:19.46  LSH      -     -     -     -  Idling
14:12:19.48  SWS      -     -     -     -  Idling
14:12:19.52  USH      -     -     -     -  Idling
14:12:21.30  SWS   -6.0     -     -     -  Telescope sent to 174.000
14:12:23.07  SWS  173.9     -     -     -  Telescope stopped.
14:12:24.06  SWS      -     -     -     -  Manual scene recording started.
14:12:24.06  LSH      -     -     -     -  Manual scene recording started.
14:12:24.08  USH      -     -     -     -  Manual scene recording started.
14:12:26.75  SWS      -     -     -     -  Dark measurement started.
14:12:26.77  USH      -     -     -     -  Dark measurement started.
14:12:26.82  LSH      -     -     -     -  Dark measurement started.
14:12:27.51  SWS      -     -     -     -  Manual scene recording started.
14:12:27.82  USH      -     -     -     -  Manual scene recording started.
14:12:28.62  LSH      -     -     -     -  Manual scene recording started.
14:14:30.09  LSH      -     -     -     -  Dark measurement started.
14:14:30.11  SWS      -     -     -     -  Dark measurement started.
14:14:30.16  USH      -     -     -     -  Dark measurement started.
14:14:31.07  SWS      -     -     -     -  Manual scene recording started.
14:14:31.37  USH      -     -     -     -  Manual scene recording started.
14:14:31.55  LSH      -     -     -     -  Manual scene recording started.
14:14:34.39  SWS  174.0     -     -     -  Telescope sent to -6.000
14:14:36.11  SWS   -5.6     -     -     -  Telescope stopped.
14:14:38.45  USH      -     -     -     -  Dark measurement started.
14:14:38.47  SWS      -     -     -     -  Dark measurement started.
14:14:38.52  LSH      -     -     -     -  Dark measurement started.
14:14:38.93  SWS      -     -     -     -  Dark measurement started.
14:14:39.34  USH      -     -     -     -  Manual scene recording started.
14:14:39.85  SWS      -     -     -     -  Idling
14:14:40.40  LSH      -     -     -     -  Manual scene recording started.
14:14:42.73  SWS      -     -     -     -  Manual scene recording started.
14:18:54.04  ---      -     -     -     -  *** 16 deg
14:21:43.48  ---      -     -     -     -  *** end of run and start of profile descent
14:24:28.80  USH      -     -     -     -  Dark measurement started.
14:24:28.81  SWS      -     -     -     -  Dark measurement started.
14:24:28.87  LSH      -     -     -     -  Dark measurement started.
14:24:29.72  USH      -     -     -     -  Manual scene recording started.
14:24:29.82  SWS      -     -     -     -  Manual scene recording started.
14:24:30.67  LSH      -     -     -     -  Manual scene recording started.
14:26:34.21  ---      -     -     -     -  *** 50 ft
14:26:43.52  ---      -     -     -     -  *** run at 100 ft
14:27:58.23  ---      -     -     -     -  *** 17 deg
14:29:02.36  ---      -     -     -     -  *** 16 deg
14:35:46.48  ---      -     -     -     -  *** 15 deg
14:35:55.45  USH      -     -     -     -  Dark measurement started.
14:35:55.52  LSH      -     -     -     -  Dark measurement started.
14:35:55.53  SWS      -     -     -     -  Dark measurement started.
14:35:56.31  USH      -     -     -     -  Manual scene recording started.
14:35:56.65  SWS      -     -     -     -  Manual scene recording started.
14:35:57.21  LSH      -     -     -     -  Manual scene recording started.
14:35:58.90  SWS      -     -     -     -  Dark measurement started.
14:35:58.92  USH      -     -     -     -  Dark measurement started.
14:35:58.97  LSH      -     -     -     -  Dark measurement started.
14:35:59.67  LSH      -     -     -     -  Dark measurement started.
14:35:59.73  SWS      -     -     -     -  Manual scene recording started.
14:36:00.03  USH      -     -     -     -  Manual scene recording started.
14:36:01.17  LSH      -     -     -     -  Idling
14:36:28.18  LSH      -     -     -     -  Manual scene recording started.
14:36:38.53  SWS      -     -     -     -  Dark measurement started.
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14:36:38.55  USH      -     -     -     -  Dark measurement started.
14:36:38.58  LSH      -     -     -     -  Dark measurement started.
14:36:39.30  SWS      -     -     -     -  Manual scene recording started.
14:36:39.74  USH      -     -     -     -  Manual scene recording started.
14:36:40.44  LSH      -     -     -     -  Manual scene recording started.
14:36:46.73  SWS   -6.0     -     -     -  Telescope sent to 174.000
14:36:48.47  SWS  173.8     -     -     -  Telescope stopped.
14:36:49.69  USH      -     -     -     -  Dark measurement started.
14:36:49.76  SWS      -     -     -     -  Dark measurement started.
14:36:49.78  LSH      -     -     -     -  Dark measurement started.
14:36:50.17  SWS      -     -     -     -  Dark measurement started.
14:36:50.44  LSH      -     -     -     -  Dark measurement started.
14:36:50.55  USH      -     -     -     -  Manual scene recording started.
14:36:51.13  SWS      -     -     -     -  Idling
14:36:51.97  LSH      -     -     -     -  Idling
14:36:53.05  LSH      -     -     -     -  Manual scene recording started.
14:36:53.05  SWS      -     -     -     -  Manual scene recording started.
14:36:57.19  SWS      -     -     -     -  Dark measurement started.
14:36:57.24  USH      -     -     -     -  Dark measurement started.
14:36:57.28  LSH      -     -     -     -  Dark measurement started.
14:36:57.99  SWS      -     -     -     -  Manual scene recording started.
14:36:58.29  USH      -     -     -     -  Manual scene recording started.
14:36:59.10  LSH      -     -     -     -  Manual scene recording started.
14:37:14.69  SWS  174.0     -     -     -  Telescope sent to -6.000
14:37:16.45  SWS   -5.9     -     -     -  Telescope stopped.
14:37:17.76  USH      -     -     -     -  Dark measurement started.
14:37:17.83  SWS      -     -     -     -  Dark measurement started.
14:37:17.84  LSH      -     -     -     -  Dark measurement started.
14:37:18.69  USH      -     -     -     -  Manual scene recording started.
14:37:18.83  SWS      -     -     -     -  Manual scene recording started.
14:37:19.81  LSH      -     -     -     -  Manual scene recording started.
14:38:38.91  ---      -     -     -     -  *** 14 deg
14:40:13.37  ---      -     -     -     -  *** 14 35 11  passed ron brown
14:41:22.71  LSH      -     -     -     -  Dark measurement started.
14:41:22.72  USH      -     -     -     -  Dark measurement started.
14:41:22.76  SWS      -     -     -     -  Dark measurement started.
14:41:23.80  USH      -     -     -     -  Manual scene recording started.
14:41:23.89  SWS      -     -     -     -  Manual scene recording started.
14:41:24.20  LSH      -     -     -     -  Manual scene recording started.
14:44:15.89  ---      -     -     -     -  *** 13 deg
14:44:59.90  ---      -     -     -     -  *** end of run and start of profile climb
14:45:02.95  ---      -     -     -     -  *** 14 deg
14:45:09.08  USH      -     -     -     -  Dark measurement started.
14:45:09.15  SWS      -     -     -     -  Dark measurement started.
14:45:09.21  LSH      -     -     -     -  Dark measurement started.
14:45:09.95  USH      -     -     -     -  Manual scene recording started.
14:45:10.09  SWS      -     -     -     -  Manual scene recording started.
14:45:11.05  LSH      -     -     -     -  Manual scene recording started.
14:45:13.28  USH      -     -     -     -  Dark measurement started.
14:45:13.31  SWS      -     -     -     -  Dark measurement started.
14:45:13.37  LSH      -     -     -     -  Dark measurement started.
14:45:14.17  USH      -     -     -     -  Manual scene recording started.
14:45:14.27  SWS      -     -     -     -  Manual scene recording started.
14:45:15.17  LSH      -     -     -     -  Manual scene recording started.
14:45:42.69  ---      -     -     -     -  *** thats was end of run 13 and start of
profile 13
14:46:35.32  ---      -     -     -     -  *** in cloud
14:47:04.00  ---      -     -     -     -  *** 15 deg
14:47:50.03  ---      -     -     -     -  *** cloud base 2700 ft
14:48:31.04  SWS      -     -     -     -  Warning: Clipping may be occurring.
14:48:35.63  SWS      -     -     -     -  Dark measurement started.
14:48:36.38  SWS      -     -     -     -  Manual scene recording started.
14:48:37.47  SWS      -     -     -     -  Dark measurement started.
14:48:38.23  SWS      -     -     -     -  Manual scene recording started.
14:48:38.61  SWS      -     -     -     -  Warning: Clipping may be occurring.
14:48:40.10  SWS      -     -    20     -  VIS int.time changed from 30ms to 20ms.
14:48:40.11  SWS      -     -     -    20  NIR int.time changed from 30ms to 20ms.
14:48:41.38  SWS      -     -     -     -  Dark measurement started.
14:48:42.06  SWS      -     -     -     -  Manual scene recording started.
```

14:48:42.91	SWS	-	-	-	-	Dark measurement started.
14:48:43.55	SWS	-	-	-	-	Manual scene recording started.
14:48:56.29	---	-	-	-	-	*** cloud top 3900 ft
14:50:42.68	LSH	-	-	-	-	Dark measurement started.
14:50:42.76	SWS	-	-	-	-	Dark measurement started.
14:50:42.80	USH	-	-	-	-	Dark measurement started.
14:50:43.54	SWS	-	-	-	-	Manual scene recording started.
14:50:44.01	USH	-	-	-	-	Manual scene recording started.
14:50:44.18	LSH	-	-	-	-	Manual scene recording started.
14:52:50.37	---	-	-	-	-	*** 16 deg
14:55:55.32	---	-	-	-	-	*** reversing profile at 6000 ft
14:55:57.68	SWS	-6.0	-	-	-	Telescope sent to 174.000
14:55:59.45	SWS	174.0	-	-	-	Telescope stopped.
14:56:01.19	SWS	-	-	-	-	Dark measurement started.
14:56:01.20	LSH	-	-	-	-	Dark measurement started.
14:56:01.26	USH	-	-	-	-	Dark measurement started.
14:56:01.88	SWS	-	-	-	-	Manual scene recording started.
14:56:02.51	USH	-	-	-	-	Manual scene recording started.
14:56:02.87	LSH	-	-	-	-	Manual scene recording started.
14:56:11.53	---	-	-	-	-	*** profile 14
15:00:40.12	---	-	-	-	-	*** run at 6000 ft
15:00:43.73	---	-	-	-	-	*** 17 deg
15:04:32.63	---	-	-	-	-	*** 15 deg
15:04:38.95	USH	-	-	-	-	Dark measurement started.
15:04:38.99	LSH	-	-	-	-	Dark measurement started.
15:04:39.03	SWS	-	-	-	-	Dark measurement started.
15:04:39.61	SWS	-	-	-	-	Dark measurement started.
15:04:39.91	USH	-	-	-	-	Manual scene recording started.
15:04:40.30	SWS	-	-	-	-	Idling
15:04:40.73	LSH	-	-	-	-	Manual scene recording started.
15:04:42.15	SWS	-	-	-	-	Manual scene recording started.
15:04:44.81	SWS	-	-	-	-	Dark measurement started.
15:04:44.85	LSH	-	-	-	-	Dark measurement started.
15:04:44.88	USH	-	-	-	-	Dark measurement started.
15:04:45.48	SWS	-	-	-	-	Manual scene recording started.
15:04:46.16	USH	-	-	-	-	Manual scene recording started.
15:04:46.58	LSH	-	-	-	-	Manual scene recording started.
15:08:27.35	---	-	-	-	-	*** end of run
15:09:38.04	---	-	-	-	-	*** 14 deg
15:09:50.93	---	-	-	-	-	*** profile descent
15:09:53.26	---	-	-	-	-	*** p 15
15:12:13.06	---	-	-	-	-	*** skimming cloud topds at 4000 ft
15:13:48.82	---	-	-	-	-	*** 15 12 01 start of run
15:15:22.54	---	-	-	-	-	*** 13 deg
15:16:14.13	---	-	-	-	-	*** 14 deg
15:16:32.84	---	-	-	-	-	*** now at 3850 ft
15:17:27.94	---	-	-	-	-	*** 15 deg
15:19:36.59	SWS	174.0	-	-	-	Telescope sent to -6.000
15:19:38.41	SWS	-6.0	-	-	-	Telescope stopped.
15:19:41.23	SWS	-	-	-	-	Dark measurement started.
15:19:41.23	USH	-	-	-	-	Dark measurement started.
15:19:41.25	LSH	-	-	-	-	Dark measurement started.
15:19:41.93	SWS	-	-	-	-	Manual scene recording started.
15:19:41.99	LSH	-	-	-	-	Dark measurement started.
15:19:42.39	USH	-	-	-	-	Manual scene recording started.
15:19:43.62	LSH	-	-	-	-	Idling
15:19:48.11	LSH	-	-	-	-	Manual scene recording started.
15:19:58.82	---	-	-	-	-	*** 15 deg
15:21:51.98	---	-	-	-	-	*** over ron brown now
15:21:56.18	---	-	-	-	-	*** end of run
15:22:05.35	---	-	-	-	-	*** profile descent to 50 ft
15:22:15.07	---	-	-	-	-	*** profile 16 (end of run 15)
15:22:54.98	---	-	-	-	-	*** 16 deg
15:23:27.30	---	-	-	-	-	*** cloud base
15:23:38.25	---	-	-	-	-	*** 15 deg
15:23:46.37	---	-	-	-	-	*** CB 2500 ft
15:25:36.90	---	-	-	-	-	*** 14 deg
15:28:00.65	---	-	-	-	-	*** 50 ft and start of profile climb
15:30:44.64	---	-	-	-	-	*** 13 deg

15:31:35.90	SWS	-	-	-	-	Warning: Clipping may be occurring.
15:31:53.73	---	-	-	-	-	*** cloud top 3900 ft
15:32:26.13	---	-	-	-	-	*** end of profile
15:32:31.40	---	-	-	-	-	*** at 4500 ft
15:32:37.42	USH	-	-	-	-	Dark measurement started.
15:32:37.47	SWS	-	-	-	-	Dark measurement started.
15:32:37.51	LSH	-	-	-	-	Dark measurement started.
15:32:38.16	LSH	-	-	-	-	Dark measurement started.
15:32:38.29	SWS	-	-	-	-	Manual scene recording started.
15:32:38.38	USH	-	-	-	-	Manual scene recording started.
15:32:39.66	LSH	-	-	-	-	Idling
15:32:40.90	LSH	-	-	-	-	Dark measurement started.
15:32:40.93	USH	-	-	-	-	Dark measurement started.
15:32:41.03	SWS	-	-	-	-	Dark measurement started.
15:32:41.97	USH	-	-	-	-	Manual scene recording started.
15:32:41.97	SWS	-	-	-	-	Manual scene recording started.
15:32:42.43	LSH	-	-	-	-	Idling
15:32:44.32	LSH	-	-	-	-	Manual scene recording started.
15:32:48.71	SWS	-	-	10	-	VIS int.time changed from 20ms to 10ms.
15:32:48.72	SWS	-	-	-	10	NIR int.time changed from 20ms to 10ms.
15:32:50.95	SWS	-	-	-	-	Dark measurement started.
15:32:50.98	USH	-	-	-	-	Dark measurement started.
15:32:51.02	LSH	-	-	-	-	Dark measurement started.
15:32:51.52	SWS	-	-	-	-	Manual scene recording started.
15:32:52.11	USH	-	-	-	-	Manual scene recording started.
15:32:52.92	LSH	-	-	-	-	Manual scene recording started.
15:32:54.66	LSH	-	-	-	-	Dark measurement started.
15:32:54.74	SWS	-	-	-	-	Dark measurement started.
15:32:54.75	USH	-	-	-	-	Dark measurement started.
15:32:55.34	USH	-	-	-	-	Dark measurement started.
15:32:55.44	SWS	-	-	-	-	Manual scene recording started.
15:32:56.12	LSH	-	-	-	-	Manual scene recording started.
15:32:56.23	USH	-	-	-	-	Idling
15:33:05.55	USH	-	-	-	-	Manual scene recording started.
15:33:10.74	---	-	-	-	-	*** 15 deg
15:36:03.74	---	-	-	-	-	*** 15 deg
15:39:51.24	---	-	-	-	-	*** 16 deg
15:40:44.20	---	-	-	-	-	*** descending for in cloud run
15:40:49.43	---	-	-	-	-	*** down to 3400 ft
15:41:03.72	---	-	-	-	-	*** cloud top
15:41:12.61	---	-	-	-	-	*** correction now
15:41:17.62	---	-	-	-	-	*** CT 3800 ft
15:41:41.81	---	-	-	-	-	*** run in cloud at 3400 ft
15:41:49.26	---	-	-	-	-	*** 16 deg
15:42:42.62	---	-	-	-	-	*** patchy cloud
15:42:49.48	---	-	-	-	-	*** 15 deg
15:43:03.88	---	-	-	-	-	*** now running at 3500 ft
15:44:07.73	---	-	-	-	-	*** going down to 3450 ft
15:47:25.16	---	-	-	-	-	*** 14 deg
15:51:42.14	---	-	-	-	-	*** end of run, and profile descent to 1000 ft
15:52:10.76	---	-	-	-	-	*** that was end of run 16 start of profile 19
15:52:52.78	---	-	-	-	-	*** 13 deg
15:54:30.34	---	-	-	-	-	*** 14 deg
15:54:32.67	SWS	-	-	-	-	Warning: Clipping may be occurring.
15:54:38.06	USH	-	-	-	-	Dark measurement started.
15:54:38.10	LSH	-	-	-	-	Dark measurement started.
15:54:38.14	SWS	-	-	-	-	Dark measurement started.
15:54:38.71	SWS	-	-	-	-	Dark measurement started.
15:54:39.00	USH	-	-	-	-	Manual scene recording started.
15:54:39.31	SWS	-	-	-	-	Idling
15:54:39.84	LSH	-	-	-	-	Manual scene recording started.
15:54:41.50	SWS	-	-	-	-	Manual scene recording started.
15:54:47.43	SWS	-	-	-	10	NIR int.time changed from 10ms to 10ms.
15:54:49.37	SWS	-	-	5	-	VIS int.time changed from 10ms to 5ms.
15:54:51.13	SWS	-	-	-	-	Dark measurement started.
15:54:51.69	SWS	-	-	-	-	Manual scene recording started.
15:54:55.17	LSH	-	-	-	-	Dark measurement started.
15:54:55.21	USH	-	-	-	-	Dark measurement started.
15:54:55.32	SWS	-	-	-	-	Dark measurement started.

15:54:56.16	SWS	-	-	-	-	Manual scene recording started.
15:54:56.30	USH	-	-	-	-	Manual scene recording started.
15:54:56.71	LSH	-	-	-	-	Manual scene recording started.
15:55:08.02	---	-	-	-	-	*** end of profile and start of run
15:55:17.75	---	-	-	-	-	*** patchy cloud above
15:57:11.76	---	-	-	-	-	*** 15 deg
15:57:21.65	SWS	-	-	-	-	Dark measurement started.
15:57:21.67	LSH	-	-	-	-	Dark measurement started.
15:57:21.78	USH	-	-	-	-	Dark measurement started.
15:57:22.23	SWS	-	-	-	-	Manual scene recording started.
15:57:23.00	USH	-	-	-	-	Manual scene recording started.
15:57:23.33	LSH	-	-	-	-	Manual scene recording started.
16:00:09.93	---	-	-	-	-	*** 16 deg
16:05:08.90	---	-	-	-	-	*** en dof run
16:05:29.20	---	-	-	-	-	*** profile climb for above cloud run
16:07:28.56	---	-	-	-	-	*** 17 deg
16:07:52.61	---	-	-	-	-	*** cloud top 3300ft
16:08:04.38	---	-	-	-	-	*** 16 deg
16:08:27.50	SWS	-	-	-	5	NIR int.time changed from 10ms to 5ms.
16:08:30.44	SWS	-	-	-	-	Dark measurement started.
16:08:30.48	LSH	-	-	-	-	Dark measurement started.
16:08:30.54	USH	-	-	-	-	Dark measurement started.
16:08:30.99	SWS	-	-	-	-	Manual scene recording started.
16:08:31.13	USH	-	-	-	-	Dark measurement started.
16:08:32.17	USH	-	-	-	-	Idling
16:08:32.21	LSH	-	-	-	-	Manual scene recording started.
16:08:34.26	USH	-	-	-	-	Manual scene recording started.
16:08:35.66	SWS	-	-	-	-	Dark measurement started.
16:08:35.71	LSH	-	-	-	-	Dark measurement started.
16:08:35.75	USH	-	-	-	-	Dark measurement started.
16:08:36.16	SWS	-	-	-	-	Manual scene recording started.
16:08:36.94	USH	-	-	-	-	Manual scene recording started.
16:08:37.37	LSH	-	-	-	-	Manual scene recording started.
16:08:42.34	SWS	-	-	40	-	VIS int.time changed from 5ms to 40ms.
16:08:42.35	SWS	-	-	-	40	NIR int.time changed from 5ms to 40ms.
16:08:42.98	SWS	-	-	-	-	Warning: Clipping may be occurring.
16:08:46.49	SWS	-6.0	-	-	-	Telescope sent to 174.000
16:08:48.26	SWS	174.0	-	-	-	Telescope stopped.
16:08:49.02	SWS	-	-	-	-	Dark measurement started.
16:08:49.05	USH	-	-	-	-	Dark measurement started.
16:08:49.09	LSH	-	-	-	-	Dark measurement started.
16:08:49.97	SWS	-	-	-	-	Manual scene recording started.
16:08:50.22	USH	-	-	-	-	Manual scene recording started.
16:08:50.98	LSH	-	-	-	-	Manual scene recording started.
16:09:11.93	---	-	-	-	-	*** run at 4500 ft above boundary layer
16:09:14.76	LSH	-	-	-	-	Dark measurement started.
16:09:14.81	USH	-	-	-	-	Dark measurement started.
16:09:14.92	SWS	-	-	-	-	Dark measurement started.
16:09:16.01	USH	-	-	-	-	Manual scene recording started.
16:09:16.25	SWS	-	-	-	-	Manual scene recording started.
16:09:16.43	LSH	-	-	-	-	Manual scene recording started.
16:09:17.88	SWS	-	-	-	-	Dark measurement started.
16:09:17.95	LSH	-	-	-	-	Dark measurement started.
16:09:17.98	USH	-	-	-	-	Dark measurement started.
16:09:18.83	SWS	-	-	-	-	Manual scene recording started.
16:09:19.29	USH	-	-	-	-	Manual scene recording started.
16:09:19.67	LSH	-	-	-	-	Manual scene recording started.
16:09:34.09	---	-	-	-	-	*** patchy cloud below
16:09:46.37	---	-	-	-	-	*** run 18
16:10:13.32	---	-	-	-	-	*** 16 deg
16:10:31.05	---	-	-	-	-	*** 15 deg
16:12:58.84	---	-	-	-	-	*** run at 4500 ft
16:13:06.81	SWS	-	-	-	-	Dark measurement started.
16:13:06.82	LSH	-	-	-	-	Dark measurement started.
16:13:06.89	USH	-	-	-	-	Dark measurement started.
16:13:07.67	SWS	-	-	-	-	Manual scene recording started.
16:13:08.17	USH	-	-	-	-	Manual scene recording started.
16:13:08.47	LSH	-	-	-	-	Manual scene recording started.
16:13:10.85	LSH	-	-	-	-	Dark measurement started.

16:13:10.90	SWS	-	-	-	-	Dark measurement started.
16:13:10.96	USH	-	-	-	-	Dark measurement started.
16:13:11.34	SWS	-	-	-	-	Dark measurement started.
16:13:12.19	USH	-	-	-	-	Manual scene recording started.
16:13:12.34	LSH	-	-	-	-	Manual scene recording started.
16:13:12.37	SWS	-	-	-	-	Idling
16:13:15.05	SWS	-	-	-	-	Manual scene recording started.
16:14:29.27	---	-	-	-	-	*** 15 deg
16:15:52.78	---	-	-	-	-	*** 14 deg
16:19:12.47	---	-	-	-	-	*** end of run
16:19:19.34	---	-	-	-	-	*** descending to 50 ft
16:19:25.53	SWS	174.0	-	-	-	Telescope sent to -6.000
16:19:27.14	SWS	-	-	-	-	Warning: Clipping may be occurring.
16:19:27.33	SWS	-6.0	-	-	-	Telescope stopped.
16:19:29.50	SWS	-	-	-	-	Dark measurement started.
16:19:29.53	USH	-	-	-	-	Dark measurement started.
16:19:29.61	LSH	-	-	-	-	Dark measurement started.
16:19:30.44	SWS	-	-	-	-	Manual scene recording started.
16:19:30.68	USH	-	-	-	-	Manual scene recording started.
16:19:31.38	LSH	-	-	-	-	Manual scene recording started.
16:19:34.20	SWS	-	-	-	-	Dark measurement started.
16:19:35.10	SWS	-	-	-	-	Manual scene recording started.
16:19:38.68	USH	-	-	-	-	Dark measurement started.
16:19:38.71	SWS	-	-	-	-	Dark measurement started.
16:19:38.74	LSH	-	-	-	-	Dark measurement started.
16:19:39.16	SWS	-	-	-	-	Dark measurement started.
16:19:39.59	USH	-	-	-	-	Manual scene recording started.
16:19:40.18	SWS	-	-	-	-	Idling
16:19:40.62	LSH	-	-	-	-	Manual scene recording started.
16:19:43.62	SWS	-	-	-	-	Manual scene recording started.
16:19:43.90	SWS	-	-	-	-	Warning: Clipping may be occurring.
16:19:47.69	SWS	-	-	10	-	VIS int.time changed from 40ms to 10ms.
16:19:47.70	SWS	-	-	-	10	NIR int.time changed from 40ms to 10ms.
16:19:51.00	SWS	-	-	5	-	VIS int.time changed from 10ms to 5ms.
16:19:51.02	SWS	-	-	-	5	NIR int.time changed from 10ms to 5ms.
16:19:54.40	SWS	-	-	-	-	Dark measurement started.
16:19:54.96	SWS	-	-	-	-	Manual scene recording started.
16:20:01.10	SWS	-	500	-	-	Sample period changed from 100ms to 500ms.
16:20:04.84	SWS	-	4000	-	-	Sample period changed from 500ms to 4000ms.
16:20:08.90	SWS	-	-	-	-	Warning: Clipping may be occurring.
16:20:12.93	SWS	-	-	-	-	Warning: Clipping may be occurring.
16:20:15.84	SWS	-6.0	-	-	-	Telescope sent to 174.000
16:20:17.64	SWS	173.9	-	-	-	Telescope stopped.
16:20:21.13	SWS	-	-	30	-	VIS int.time changed from 5ms to 30ms.
16:20:21.14	SWS	-	-	-	30	NIR int.time changed from 5ms to 30ms.
16:20:25.57	SWS	-	100	-	-	Sample period changed from 4000ms to 100ms.
16:20:29.48	SWS	-	-	-	-	Dark measurement started.
16:20:30.37	SWS	-	-	-	-	Manual scene recording started.
16:20:32.33	SWS	-	-	-	-	Dark measurement started.
16:20:32.36	LSH	-	-	-	-	Dark measurement started.
16:20:32.39	USH	-	-	-	-	Dark measurement started.
16:20:33.16	SWS	-	-	-	-	Manual scene recording started.
16:20:33.62	USH	-	-	-	-	Manual scene recording started.
16:20:34.10	LSH	-	-	-	-	Manual scene recording started.
16:20:34.97	LSH	-	-	-	-	Dark measurement started.
16:20:35.06	USH	-	-	-	-	Dark measurement started.
16:20:35.10	SWS	-	-	-	-	Dark measurement started.
16:20:36.10	USH	-	-	-	-	Manual scene recording started.
16:20:36.25	SWS	-	-	-	-	Manual scene recording started.
16:20:36.46	LSH	-	-	-	-	Manual scene recording started.
16:21:04.94	---	-	-	-	-	*** 14 deg
16:22:04.46	---	-	-	-	-	*** 13 deg
16:22:28.87	---	-	-	-	-	*** 13 deg
16:22:42.66	---	-	-	-	-	*** 14 deg
16:24:40.34	---	-	-	-	-	*** 15 deg
16:25:24.75	---	-	-	-	-	*** 50 ft, reversing sawtooth
16:25:28.29	USH	-	-	-	-	Idling
16:25:28.35	LSH	-	-	-	-	Idling
16:25:28.47	SWS	-	-	-	-	Idling

16:25:29.77	SWS	174.0	-	-	-	Telescope sent to -6.000
16:25:31.54	SWS	-6.0	-	-	-	Telescope stopped.
16:25:33.62	SWS	-	-	10	-	VIS int.time changed from 30ms to 10ms.
16:25:33.63	SWS	-	-	-	10	NIR int.time changed from 30ms to 10ms.
16:25:35.19	SWS	-	-	-	-	Manual scene recording started.
16:25:35.20	LSH	-	-	-	-	Manual scene recording started.
16:25:35.21	USH	-	-	-	-	Manual scene recording started.
16:25:35.94	SWS	-	-	-	-	Warning: Clipping may be occurring.
16:25:40.37	SWS	-	-	5	-	VIS int.time changed from 10ms to 5ms.
16:25:40.38	SWS	-	-	-	5	NIR int.time changed from 10ms to 5ms.
16:25:45.78	SWS	-6.0	-	-	-	Telescope sent to 174.000
16:25:47.56	SWS	173.9	-	-	-	Telescope stopped.
16:25:49.75	SWS	-	-	30	-	VIS int.time changed from 5ms to 30ms.
16:25:49.76	SWS	-	-	-	30	NIR int.time changed from 5ms to 30ms.
16:25:53.29	SWS	-	-	40	-	VIS int.time changed from 30ms to 40ms.
16:25:53.30	SWS	-	-	-	40	NIR int.time changed from 30ms to 40ms.
16:25:56.31	LSH	-	-	-	-	Dark measurement started.
16:25:56.33	USH	-	-	-	-	Dark measurement started.
16:25:56.34	SWS	-	-	-	-	Dark measurement started.
16:25:57.45	USH	-	-	-	-	Manual scene recording started.
16:25:57.59	SWS	-	-	-	-	Manual scene recording started.
16:25:57.77	LSH	-	-	-	-	Manual scene recording started.
16:26:34.69	SWS	-	-	-	-	Dark measurement started.
16:26:34.75	USH	-	-	-	-	Dark measurement started.
16:26:34.75	LSH	-	-	-	-	Dark measurement started.
16:26:35.58	SWS	-	-	-	-	Manual scene recording started.
16:26:35.79	USH	-	-	-	-	Manual scene recording started.
16:26:36.64	LSH	-	-	-	-	Manual scene recording started.
16:29:19.81	---	-	-	-	-	*** cloud top 3350 ft
16:29:27.07	---	-	-	-	-	*** 16 deg
16:30:07.96	---	-	-	-	-	*** 15 deg
16:30:53.64	---	-	-	-	-	*** reverse climb at 5000 ft
16:31:04.09	---	-	-	-	-	*** descending to 500 ft
16:32:06.37	---	-	-	-	-	*** 14 deg
16:33:16.68	---	-	-	-	-	*** cloud top
16:33:34.20	---	-	-	-	-	*** cloud top was 3400 ft
16:33:48.78	---	-	-	-	-	*** cloud base
16:34:17.57	LSH	-	-	-	-	Dark measurement started.
16:34:17.61	USH	-	-	-	-	Dark measurement started.
16:34:17.63	SWS	-	-	-	-	Dark measurement started.
16:34:18.74	USH	-	-	-	-	Manual scene recording started.
16:34:19.00	SWS	-	-	-	-	Manual scene recording started.
16:34:19.18	LSH	-	-	-	-	Manual scene recording started.
16:34:19.91	LSH	-	-	-	-	Dark measurement started.
16:34:19.99	USH	-	-	-	-	Dark measurement started.
16:34:20.03	SWS	-	-	-	-	Dark measurement started.
16:34:21.08	USH	-	-	-	-	Manual scene recording started.
16:34:21.33	SWS	-	-	-	-	Manual scene recording started.
16:34:21.42	LSH	-	-	-	-	Manual scene recording started.
16:34:23.67	SWS	-	-	10	-	VIS int.time changed from 40ms to 10ms.
16:34:23.69	SWS	-	-	-	10	NIR int.time changed from 40ms to 10ms.
16:34:25.57	SWS	-	-	-	-	Dark measurement started.
16:34:26.17	SWS	-	-	-	-	Manual scene recording started.
16:34:27.23	SWS	-	-	-	-	Dark measurement started.
16:34:27.88	SWS	-	-	-	-	Manual scene recording started.
16:34:29.18	SWS	174.0	-	-	-	Telescope sent to -6.000
16:34:30.64	SWS	-	-	-	-	Warning: Clipping may be occurring.
16:34:30.93	SWS	-5.9	-	-	-	Telescope stopped.
16:34:33.90	SWS	-	-	-	10	NIR int.time changed from 10ms to 10ms.
16:34:35.75	SWS	-	-	5	-	VIS int.time changed from 10ms to 5ms.
16:34:37.48	SWS	-	-	-	-	Dark measurement started.
16:34:38.09	SWS	-	-	-	-	Manual scene recording started.
16:34:40.22	SWS	-	-	-	-	Dark measurement started.
16:34:40.80	SWS	-	-	-	-	Manual scene recording started.
16:34:52.71	SWS	-	-	-	-	Dark measurement started.
16:34:53.28	SWS	-	-	-	-	Manual scene recording started.
16:37:24.70	---	-	-	-	-	*** reversing sawtooth at 500 ft
16:37:26.99	SWS	-	-	-	-	Warning: Clipping may be occurring.
16:37:31.41	SWS	-6.0	-	-	-	Telescope sent to 174.000

16:37:33.20	SWS	173.9	-	-	-	Telescope stopped.
16:37:34.07	SWS	-	-	-	5	NIR int.time changed from 10ms to 5ms.
16:37:36.87	SWS	-	-	30	-	VIS int.time changed from 5ms to 30ms.
16:37:36.88	SWS	-	-	-	30	NIR int.time changed from 5ms to 30ms.
16:37:38.12	SWS	-	-	-	-	Dark measurement started.
16:37:38.91	SWS	-	-	-	-	Manual scene recording started.
16:37:40.32	USH	-	-	-	-	Dark measurement started.
16:37:40.36	LSH	-	-	-	-	Dark measurement started.
16:37:40.39	SWS	-	-	-	-	Dark measurement started.
16:37:41.19	USH	-	-	-	-	Manual scene recording started.
16:37:41.51	SWS	-	-	-	-	Manual scene recording started.
16:37:41.99	LSH	-	-	-	-	Manual scene recording started.
16:37:43.37	SWS	-	-	-	-	Dark measurement started.
16:37:43.38	USH	-	-	-	-	Dark measurement started.
16:37:43.39	LSH	-	-	-	-	Dark measurement started.
16:37:44.15	SWS	-	-	-	-	Manual scene recording started.
16:37:44.45	USH	-	-	-	-	Manual scene recording started.
16:37:45.31	LSH	-	-	-	-	Manual scene recording started.
16:37:48.98	SWS	-	-	-	-	Warning: Clipping may be occurring.
16:37:49.98	---	-	-	-	-	*** 13 deg
16:37:55.99	SWS	-	-	20	-	VIS int.time changed from 30ms to 20ms.
16:37:56.00	SWS	-	-	-	20	NIR int.time changed from 30ms to 20ms.
16:37:57.53	SWS	-	-	-	-	Dark measurement started.
16:37:58.22	SWS	-	-	-	-	Manual scene recording started.
16:37:59.94	SWS	-	-	-	-	Dark measurement started.
16:38:00.59	SWS	-	-	-	-	Manual scene recording started.
16:38:10.14	---	-	-	-	-	*** 13 deg
16:38:13.22	SWS	-	-	-	-	Idling
16:38:13.25	USH	-	-	-	-	Idling
16:38:13.27	LSH	-	-	-	-	Idling
16:38:14.66	---	-	-	-	-	Reset shutters.
16:38:18.11	SWS	-	-	-	-	Manual scene recording started.
16:38:18.13	LSH	-	-	-	-	Manual scene recording started.
16:38:18.14	USH	-	-	-	-	Manual scene recording started.
16:38:26.25	SWS	-	-	25	-	VIS int.time changed from 20ms to 25ms.
16:38:26.27	SWS	-	-	-	25	NIR int.time changed from 20ms to 25ms.
16:38:29.38	SWS	-	-	45	-	VIS int.time changed from 25ms to 45ms.
16:38:29.39	SWS	-	-	-	45	NIR int.time changed from 25ms to 45ms.
16:38:32.68	SWS	-	-	20	-	VIS int.time changed from 45ms to 20ms.
16:38:32.71	SWS	-	-	-	20	NIR int.time changed from 45ms to 20ms.
16:38:46.85	---	-	-	-	-	*** sws doing very strange things
16:38:52.30	---	-	-	-	-	*** signal enermous
16:39:05.70	---	-	-	-	-	*** VIS has now dropped out completely
16:39:17.74	---	-	-	-	-	Reset shutters.
16:39:21.01	---	-	-	-	-	Reset shutters.
16:39:24.35	SWS	-	-	-	-	Dark measurement started.
16:39:25.03	SWS	-	-	-	-	Manual scene recording started.
16:39:26.97	SWS	-	-	-	-	Manual scene sampling started - Not Recording!
16:39:29.92	SWS	-	-	-	-	Manual scene recording started.
16:39:33.80	SWS	-	-	-	20	NIR int.time changed from 20ms to 20ms.
16:39:36.20	SWS	-	-	600	-	VIS int.time changed from 20ms to 600ms.
16:39:40.18	SWS	-	-	10	-	VIS int.time changed from 600ms to 10ms.
16:39:43.21	SWS	-	-	-	-	Dark measurement started.
16:39:43.87	SWS	-	-	-	-	Manual scene recording started.
16:39:44.69	SWS	-	-	-	-	Dark measurement started.
16:39:45.39	SWS	-	-	-	-	Manual scene recording started.
16:39:49.16	SWS	-	-	5	-	VIS int.time changed from 10ms to 5ms.
16:39:51.84	SWS	-	-	-	-	Dark measurement started.
16:39:52.50	SWS	-	-	-	-	Manual scene recording started.
16:39:52.85	SWS	-	-	-	-	Dark measurement started.
16:39:53.50	SWS	-	-	-	-	Manual scene recording started.
16:39:57.50	SWS	-	-	20	-	VIS int.time changed from 5ms to 20ms.
16:39:59.23	SWS	-	-	-	20	NIR int.time changed from 20ms to 20ms.
16:40:02.48	SWS	-	-	-	-	Dark measurement started.
16:40:03.15	SWS	-	-	-	-	Manual scene recording started.
16:40:04.79	SWS	-	-	-	-	Dark measurement started.
16:40:05.51	SWS	-	-	-	-	Manual scene recording started.
16:40:31.48	SWS	-	-	-	-	Idling
16:40:31.52	LSH	-	-	-	-	Idling

```
16:40:31.58  USH      -     -     -     -  Idling
16:40:33.52  SWS  174.0     -     -     -  Telescope sent to -6.000
16:40:35.30  SWS   -5.9     -     -     -  Telescope stopped.
16:40:36.65  USH      -     -     -     -  Manual scene recording started.
16:40:36.66  LSH      -     -     -     -  Manual scene recording started.
16:40:36.68  SWS      -     -     -     -  Manual scene recording started.
16:40:37.32  SWS      -     -     -     -  Warning: Clipping may be occurring.
16:40:40.55  LSH      -     -     -     -  Idling
16:40:40.61  USH      -     -     -     -  Idling
16:40:40.62  SWS      -     -     -     -  Idling
16:40:42.58  SWS   -6.0     -     -     -  Telescope sent to 174.000
16:40:44.34  SWS  173.9     -     -     -  Telescope stopped.
16:40:45.26  SWS      -     -     -     -  Manual scene recording started.
16:40:45.27  LSH      -     -     -     -  Manual scene recording started.
16:40:45.28  USH      -     -     -     -  Manual scene recording started.
16:40:55.65  ---      -     -     -     -  *** 15 deg
16:44:00.37  ---      -     -     -     -  *** 15 deg
16:44:06.86  USH      -     -     -     -  Idling
16:44:06.88  LSH      -     -     -     -  Idling
16:44:06.93  SWS      -     -     -     -  Idling
16:44:07.97  USH      -     -     -     -  Manual scene recording started.
16:44:09.59  LSH      -     -     -     -  Manual scene recording started.
16:44:18.32  SWS  174.0     -     -     -  Telescope sent to 90.000
16:44:19.50  SWS   90.0     -     -     -  Telescope stopped.
16:55:24.81  SWS      -     -     -     -  Manual scene recording started.
16:55:28.40  SWS   90.0     -     -     -  Telescope sent to -6.000
16:55:29.57  SWS   -6.0     -     -     -  Telescope stopped.
16:55:39.91  LSH      -     -     -     -  Dark measurement started.
16:55:39.95  USH      -     -     -     -  Dark measurement started.
16:55:40.03  SWS      -     -     -     -  Dark measurement started.
16:55:41.02  SWS      -     -     -     -  Manual scene recording started.
16:55:41.70  LSH      -     -     -     -  Manual scene recording started.
16:55:42.10  USH      -     -     -     -  Manual scene recording started.
```

Flight: B419

KEY

Not Fitted	Duff Data
Fitted, Not Operated	Minor Problem
	OK

Thermometers
- Cabin Temperature:
- Heimann:
- Deiced Temp:
- Non-deiced Temp:

Hygrometers
- FWVS:
- Buck CR2:
- General Eastern:
- Johnson Williams:
- Nevzorov:
- Total Water Probe:

Cameras
- Downward Facing:
- Forward Facing:
- Rearward Facing:
- Upward Facing:

Navigation + Aircraft
- Cruciform GPS:
- GIN Applanix:
- INU Honeywell:
- Radar Altimeter:
- RVSM IAS:
- RVSM Static Pressure:
- XR5 GPS:

Misc Core
- HORACE:
- AMTG:
- AVAPS:
- Cabin Pressure:
- Printer:
- S9 Static Pressure:
- Satcom C:
- Satcom H (VIRC):
- Turb Centre-Static:
- Turb Left Right:
- Turb Up-Down:
- Turb Horizontal Chk:
- Turb Vertical Chk:
- Weather Radar:

DLUs:
- DLU AERACK:
- DLU BBR Lower:
- DLU BBR Upper:
- DLU Core Chem:
- DLU Core Consoles:
- DLU Port Aft:
- DLU Port Fwd:
- DLU Stbd Fwd:

Radiometers
Lower:
- BBR (clear) Lower:
- BBR (IR) Lower:
- BBR (red) Lower:

Upper:
- BBR (clear) Upper:
- BBR (IR) Upper:
- BBR (red) Upper:

- ARIES:
- DEIMOS:
- IR Camera:
- JNO2 Lower:
- JNO2 Upper:
- JO1D Lower:
- JO1D Upper:
- MARSS:
- SHIMS Lower:
- SHIMS Upper:
- SWS:
- TAFTS:

Cloud Probes
- 2DC:
- 2DP:
- FFSSP:
- PCASP:
- PCASP SPP-200:
- 2DS:
- ADA:
- CAPS:
- CCN:
- CDP (fuselage):
- CDP (Canister):
- CIP 100 (PIP):
- CIP 25 (CIP):
- CPI:
- CVI (Inlet):
- CVI PCASP-X:
- CVI Ly-A Hygro:
- FSSP (UMan):
- SID1:
- SID2:
- SID3:

Aerosol
- CPC 3025A:
- CPC 3786 H2O:
- Filters 47mm:
- Filters 90mm:
- Neph - Dry:
- Neph - Wet:
- PSAP:
- AMS:
- CPC (AMS):
- SMPS (AMS):
- CPC 3010A (CVI):
- INC:
- Mini-LIDAR:
- SP2:
- UHSAS:
- VACC:

Chemistry
- CO Aerolaser 5002:
- NOx TE42C:
- Ozone TE49C:
- Ozone TE49:
- SO2 TE43C:
- TDLAS (NIR) CH4:
- TDLAS (NIR) CO2:
- FAGE:
- Formaldehyde:
- NOx FAAM:
- NOxy:
- ORAC:
- PAN:
- PERCA:
- Peroxide:
- PTRMS:
- TDLAS (1C):
- WAS Bags:
- WAS Bottles:

Misc Non-Core
- CASI/ATM:
- LIDAR (big):
- LTI:
- SAW Hygrometer:

Report Created 15/09/2009 14:24:51

Last Updated: 21/11/2008 14:15:36

Faults / Incidents Log

Flight No. B419
Date: 12/11/08

Issues

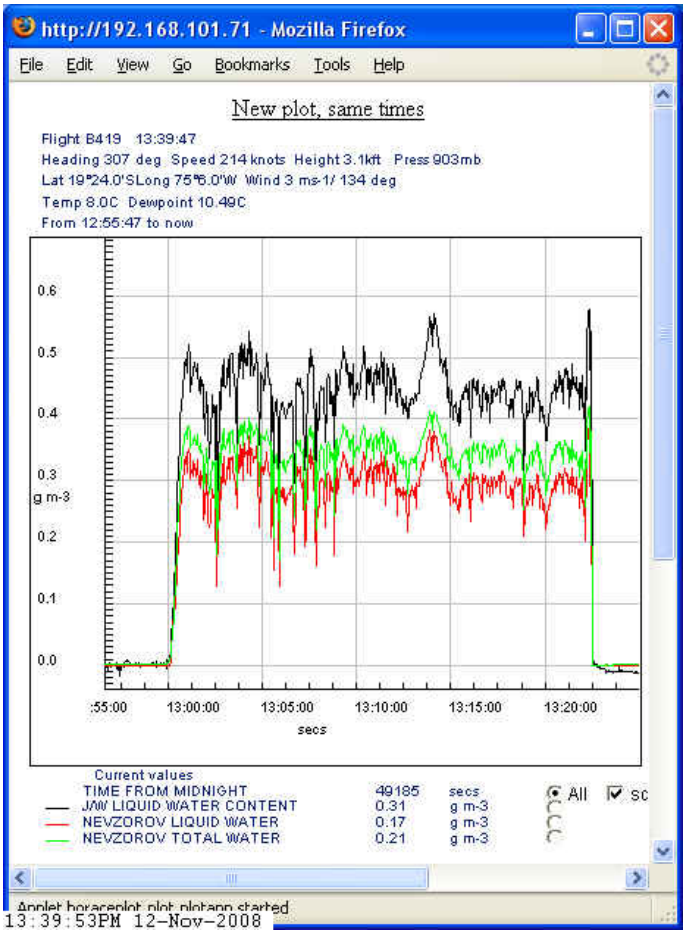
1. BBRs- Upper Pyrgeometer signal / zero very noisy.
2. RFC/DFC bay – suspect water running down inside of RFC window
3. TWC – Detector signal occasionally topping out at 4095 around 1445Z onwards. Status bit 4094. Window needing cleaned?

Instruments

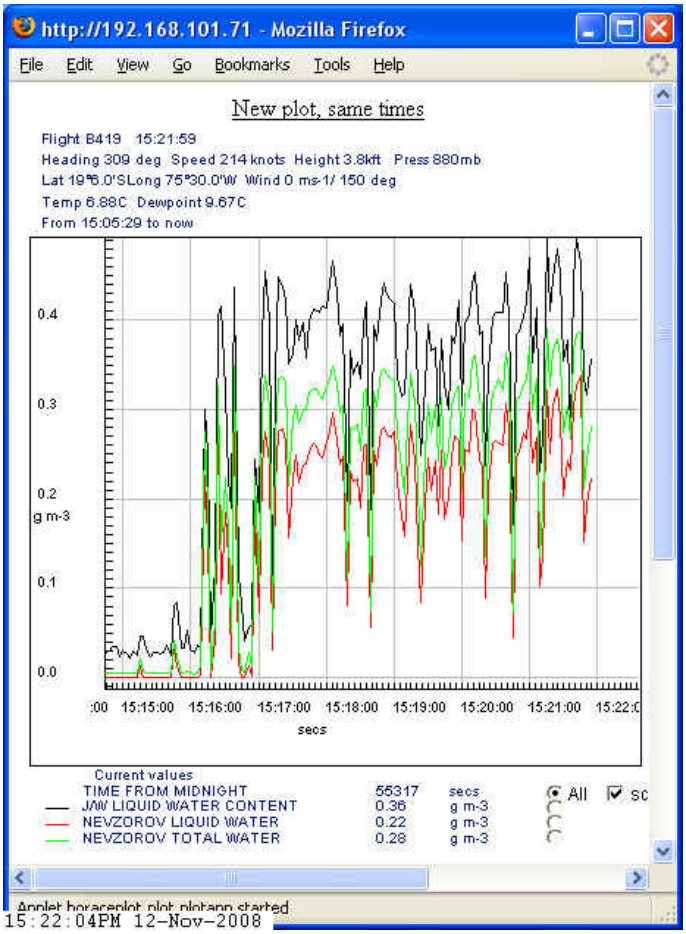
Dropsondes	Nil
CVI -	ok
Filters	ok
Neph	ok
PSAP	ok
WetNeph	ok
AMS	ok
Core Chem	ok
Cloud physics -	ok PCASP channel 1 noisy otherwise scale error (leak) Ok
ARIES -	ok
MARSS -	ok
SWS -	minor problems
CCN	ok, single channel only.
CPC	ok
PAN	ok
2DS -	ok
CAPS -	ok
SMPS -	ok
Buck -	experimental operation ->ok

Aircraft

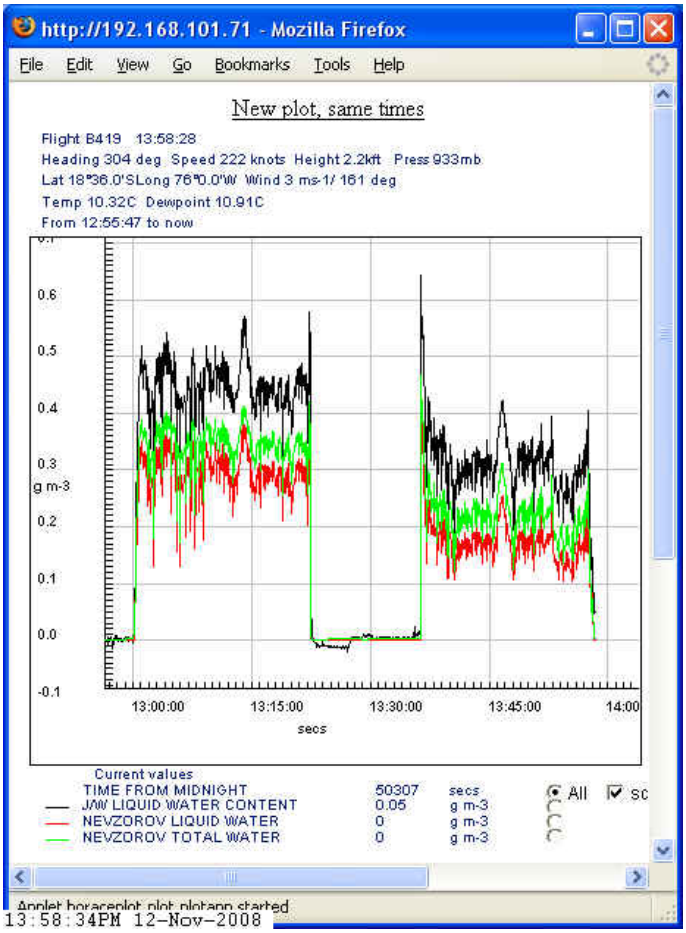
SatcomC	ok
MPDS	Run for flight, ok
ISDN Emails	Nil
Satcom-H Calls	Nil



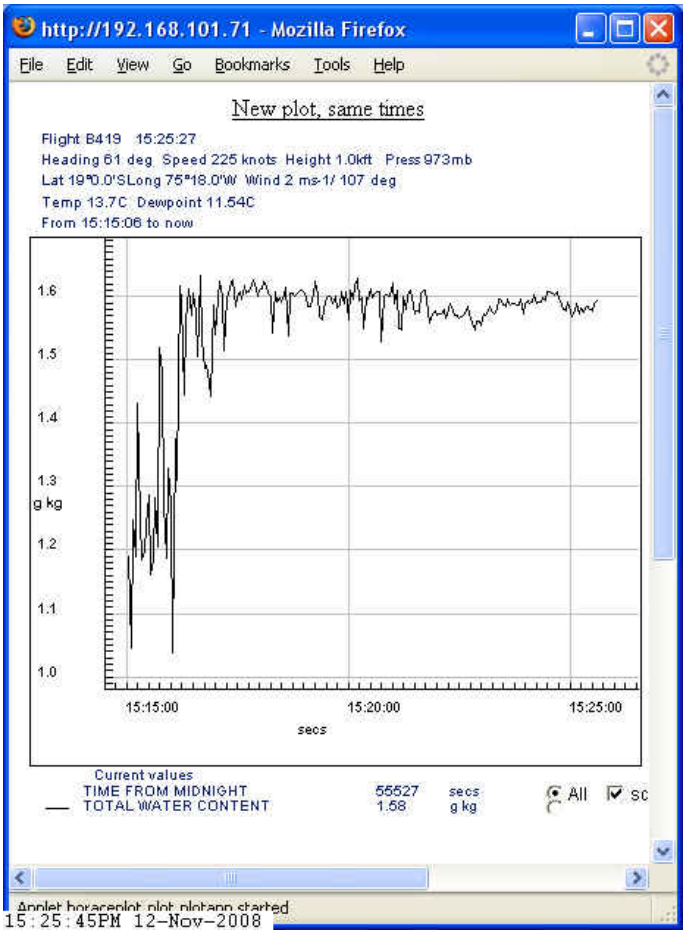
B419 lwc run8



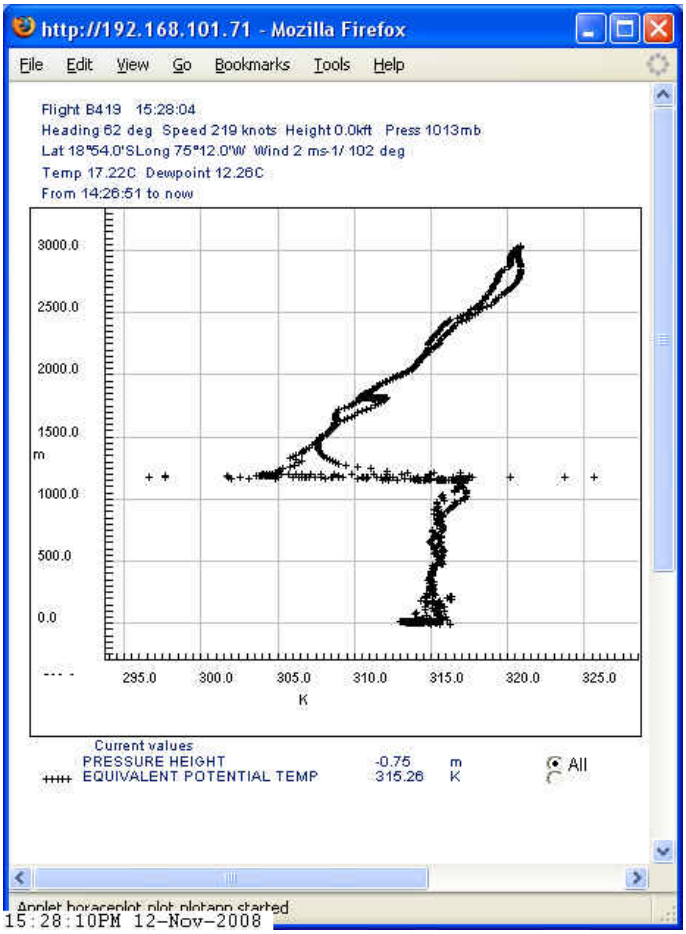
B419 lwc run15 cloud top



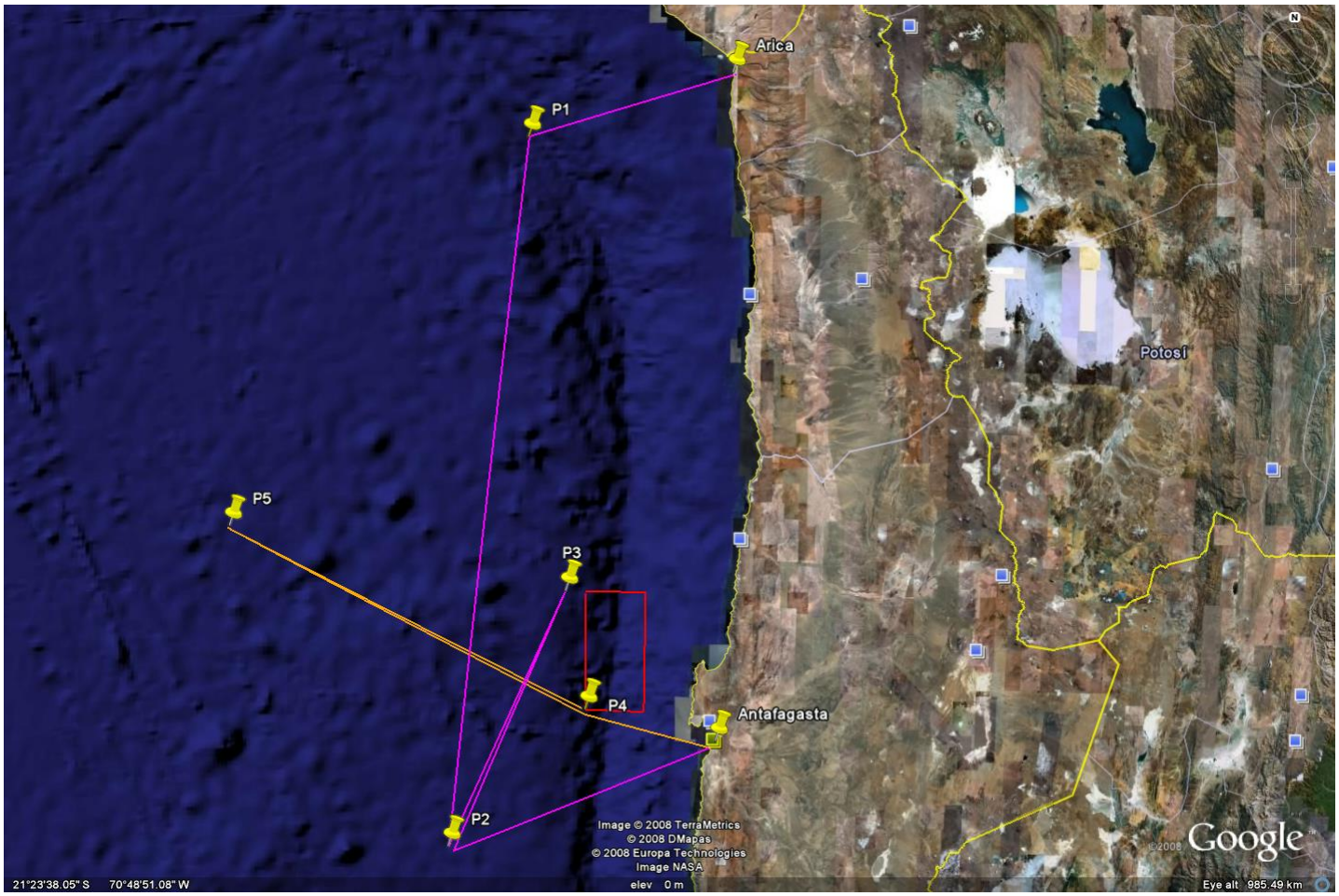
B419 lwc run10-11

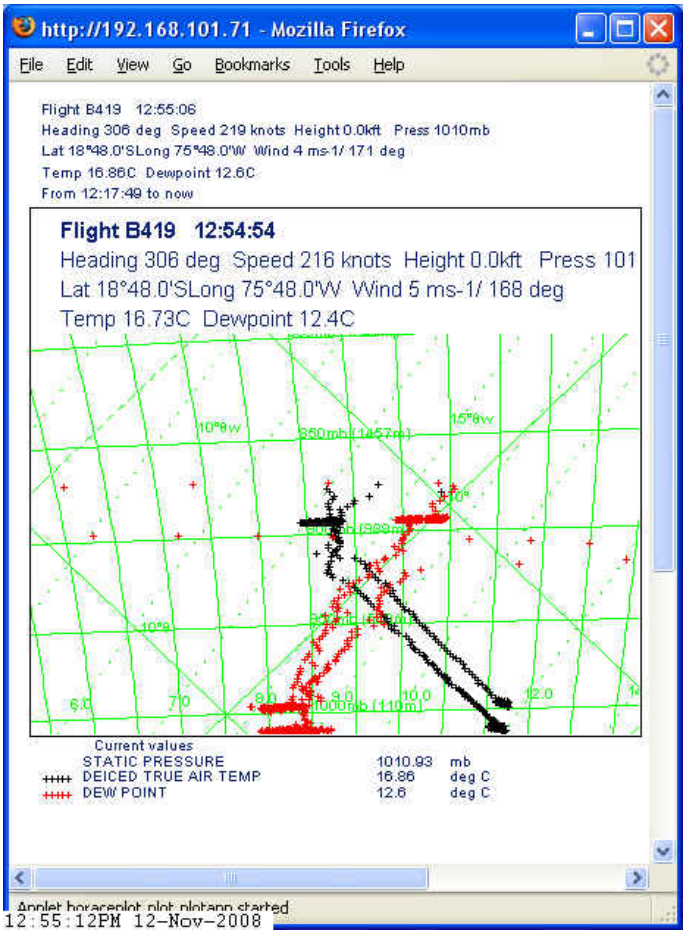


B419 TWC run 15 bad cal

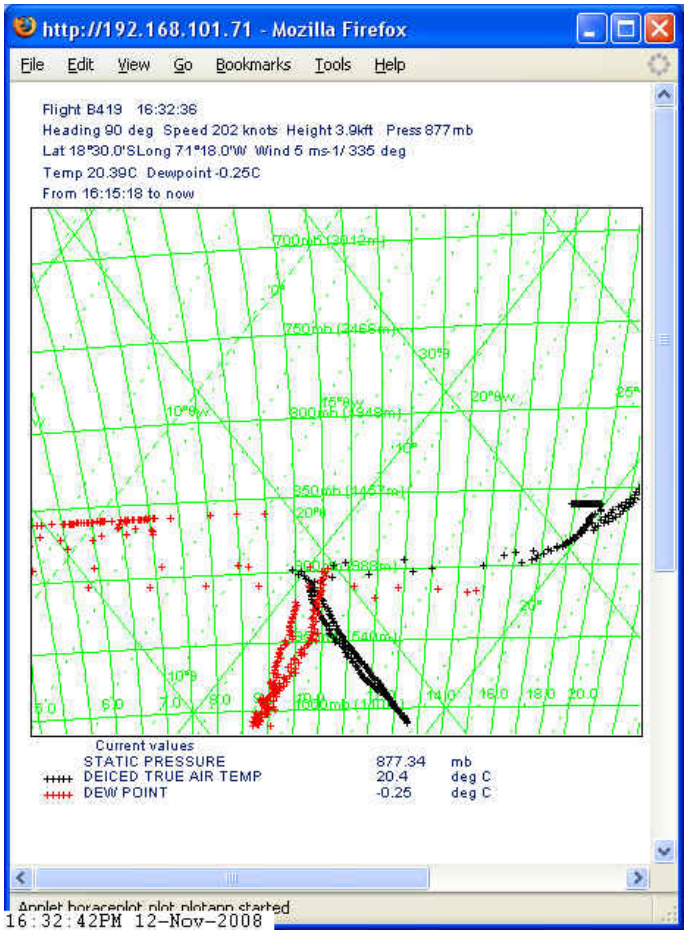


B419 theta-e profiles P14-16

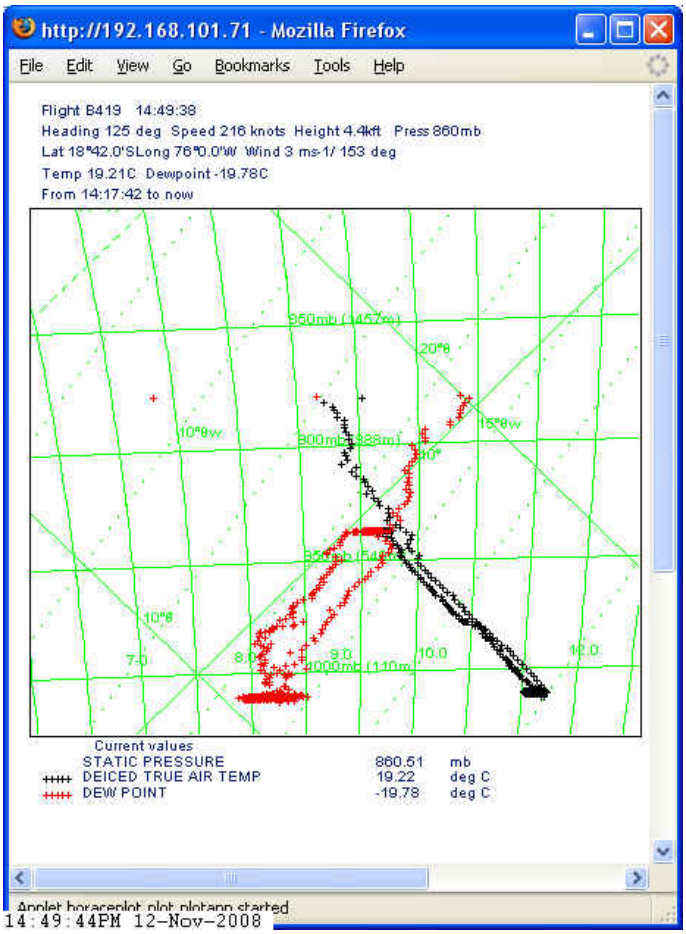




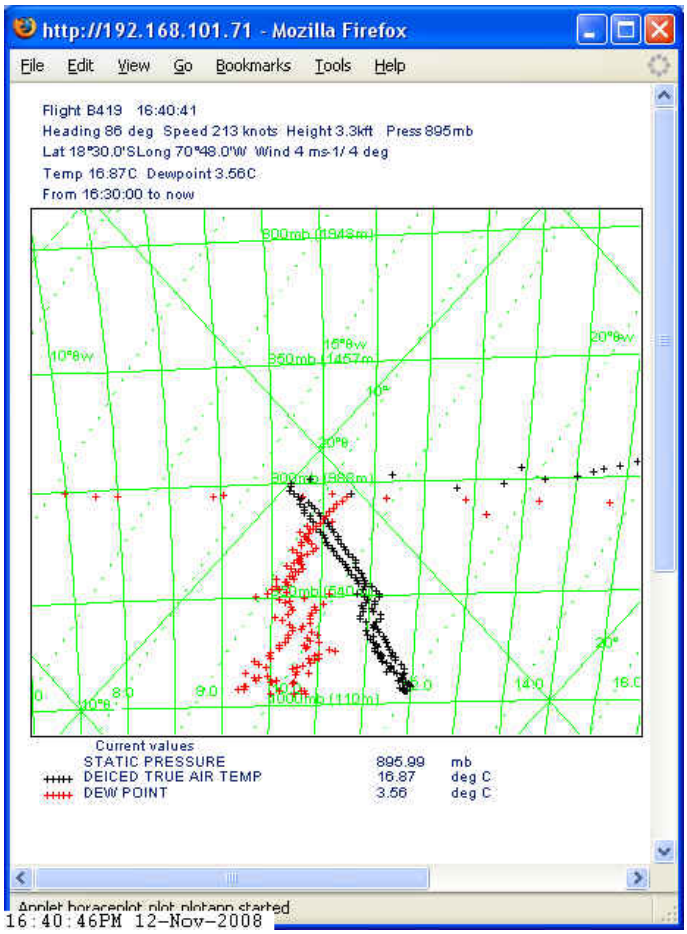
b419 TEPHI P7-8



b419 TEPHI P21-22



b419 TEPHI P12-13a



b419 TEPHI P23-24

MISSING LOG SHEETS:

The following log sheets are not available for flight B419:

Log	Reason
Pre-flighter log	No log available
De-brief	No debrief has been completed by the Mission Scientist
Cloud Physics Processing	No cloud physics processing logs are expected for VOCALS flights
Core Chemistry / TDLAS	no In Flight log except in cases of instrument problems
CCN log	CCN operator does not create a log sheet
MARSS	No log as instrument went U/S
Dry Neph	Operator does not create a log sheet
2D-S / CAPS	2D-S / CAPS operator does not create a log sheet
AMS log	AMS operator does not create a log sheet
PAN log	PAN operator does not create a log sheet
VACC	Operator does not create a log sheet

Document control

Revision	Date	Author	Comments
r0	16 Sep 2009	Doug Anderson	Initial version missing the above noted logs
r1			
r2			

Digital video recordings in avi format:

faam-video-dfc_faam_20081112_r0_b419_112925_1hz.avi
faam-video-dfc_faam_20081112_r0_b419_122925_1hz.avi
faam-video-dfc_faam_20081112_r0_b419_132925_1hz.av
faam-video-dfc_faam_20081112_r0_b419_142925_1hz.av
faam-video-dfc_faam_20081112_r0_b419_152925_1hz.av
faam-video-dfc_faam_20081112_r0_b419_162925_1hz.av

faam-video-rfc_faam_20081112_r0_b419_112917_1hz.avi
faam-video-rfc_faam_20081112_r0_b419_122917_1hz.avi
faam-video-rfc_faam_20081112_r0_b419_132917_1hz.avi
faam-video-rfc_faam_20081112_r0_b419_142917_1hz.avi
faam-video-rfc_faam_20081112_r0_b419_152917_1hz.avi
faam-video-rfc_faam_20081112_r0_b419_162917_1hz.avi

faam-video-ffc_faam_20081112_r0_b419_112914_1hz.avi
faam-video-ffc_faam_20081112_r0_b419_122914_1hz.avi
faam-video-ffc_faam_20081112_r0_b419_132914_1hz.avi
faam-video-ffc_faam_20081112_r0_b419_142914_1hz.avi
faam-video-ffc_faam_20081112_r0_b419_152914_1hz.avi
faam-video-ffc_faam_20081112_r0_b419_162914_1hz.avi

faam-video-ufc_faam_20081112_r0_b419_112921_1hz.avi
faam-video-ufc_faam_20081112_r0_b419_122921_1hz.avi
faam-video-ufc_faam_20081112_r0_b419_132921_1hz.avi
faam-video-ufc_faam_20081112_r0_b419_142921_1hz.avi
faam-video-ufc_faam_20081112_r0_b419_152921_1hz.avi
faam-video-ufc_faam_20081112_r0_b419_162921_1hz.avi

No Digital8 video recordings were made on this flight.